

Construction Methods

September
1927

McGraw-Hill Publishing Company, Inc., New York, N. Y.

Setting Steel
Carnegie Steel Co. Warehouse
near Houston, Texas

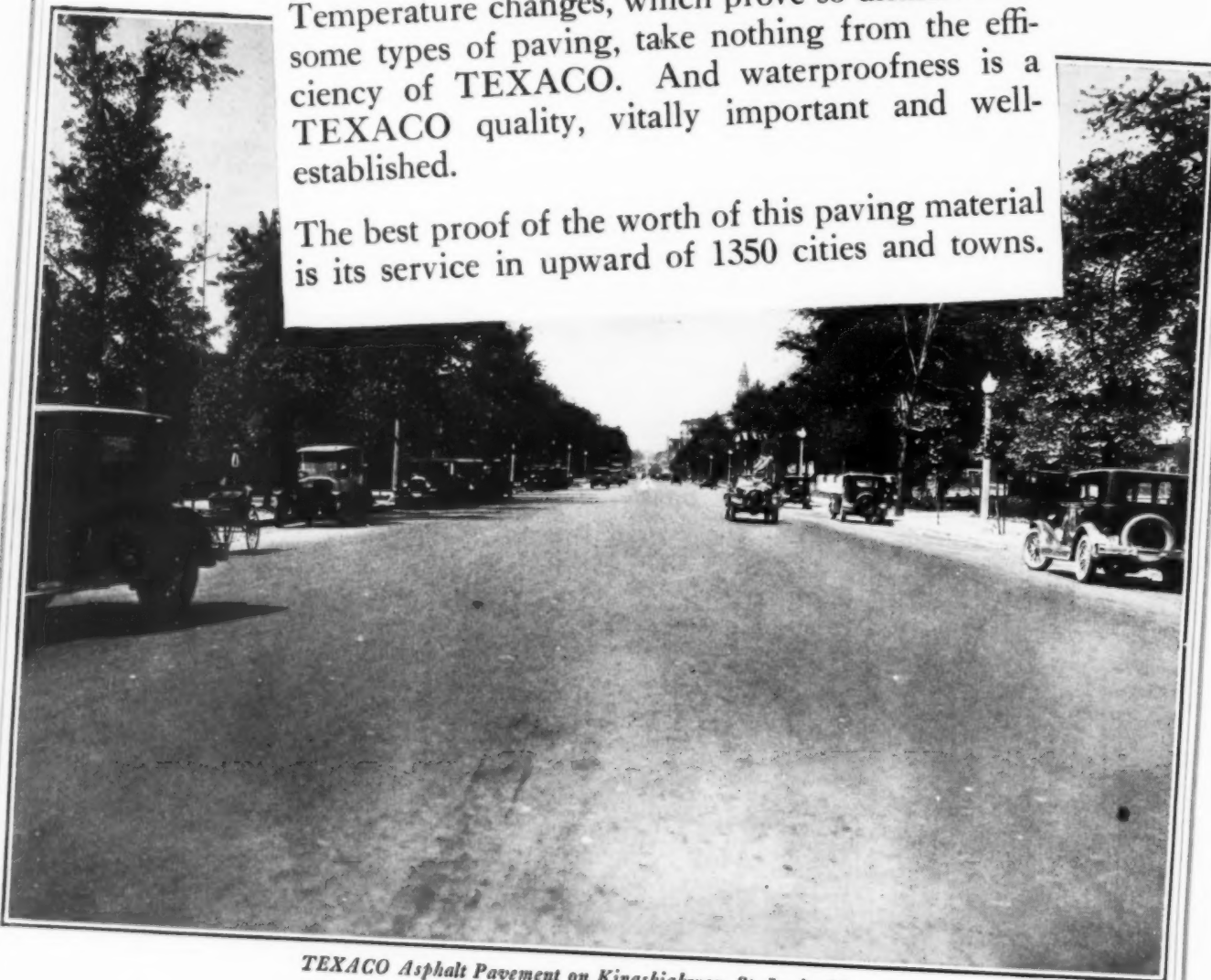
A MONTHLY PICTORIAL CONCERNING PRACTICE AND EQUIPMENT
General Construction Buildings Engineering Industry

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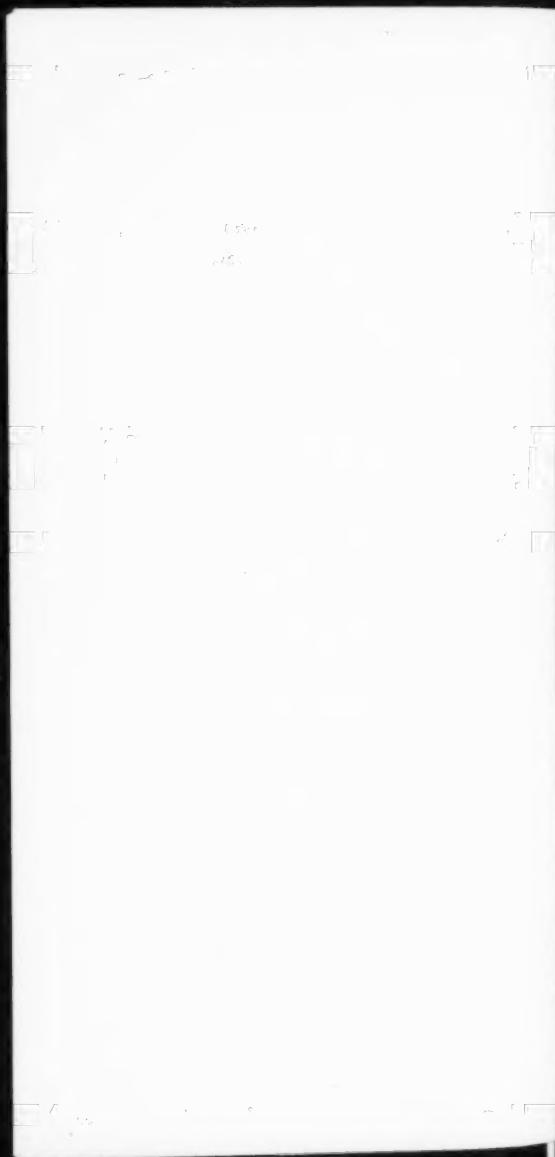
Chicago
Cleveland
Kansas City
Houston
Dallas

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CONSTRUCTION METHODS

Tenth Avenue at 36th Street

New York, N. Y.



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What a bargain this is!

What's \$1 compared to what you will receive in return? Certainly you're not going to let 3 cents a month delay you in returning the coupon below that will bring *Construction Methods* to you each and every month for 3 years.

There is absolutely no catch to this offer. One dollar pinned to the coupon below will bring *Construction Methods* to you each month for 3 years.

We know that it sounds almost too good to be true. But it's a fact just the same. The McGraw-Hill Publishing Company—the company that publishes *Engineering News-Record*, *Electrical World*, *Power*, *Coal Age*, *Engineering and Mining Journal* and 10 other publications stands back of this offer.

Don't Delay—Return the coupon with \$1—Today!

We will freely admit however that the low charter rate won't last much longer. It's just an introductory offer—and the fact that more than 18,500 construction men have taken advantage of it since April 1926 convinces us that the introductory period is nearly over. The price is going up—but you can still get your subscription in under the low charter rate by returning the coupon below—Now.

Fill in lines below, attach \$1, return in envelope



Among the 18,500 charter subscribers to *Construction Methods* are

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If *Construction Methods* is useful to men in all these different branches of the industry, isn't it a good bet that it will be useful to you also.

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Construction Methods
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Send me *Construction Methods* every month for three years, thus making sure that I'll know how other construction men are using new methods to Save Time—Save Money—Speed Up Construction—Make Better Use of Equipment—and Overcome All Sorts of Obstacles and Problems. Start my subscription with the next issue, please. My dollar is attached.

IMPORTANT

If your accounting office system does not permit you to send cash with order, we will honor your purchase order or requisition.

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Count me in!

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Higgins Was a Master Salesman—

One of those rare birds who didn't know there was such a word as "No" and so ingenious at devising new arguments that it was a pleasure to succumb to his blandishments.

One day, we were discussing *Construction Methods*—"Man alive," he enthused, "the man that can't sell that live pictorial paper doesn't deserve to be called a salesman. Just look at this."

From a side pocket he extracted three pennies. Holding this in the palm of one hand and the current issue of *Construction Methods* in the other, he said impressively:

"Is there a sensible contractor, construction engineer, superintendent or foreman who will weigh for a single instant the value of these 3 little pennies against the worth to him, of the information in this issue of *Construction Methods*."

"Not on your life! Just multiply this by thirty-six—the number of issues in a charter 3-year subscription and see what an overwhelming sales argument you have."

Not a bad idea at all! Broken down into its component parts and analyzed to your everyday needs, here's what 36 issues of *Construction Methods* contain:

- Up-to-date Highway and Paving Methods, Equipment and Short cuts.
- Up-to-date General Construction Methods, Equipment and Short cuts.
- Up-to-date Building Construction Methods, Equipment and Short cuts.
- Up-to-date Sewer Construction Methods, Equipment and Short cuts.
- Up-to-date Bridge Construction Methods, Equipment and Short cuts.
- Up-to-date Railroad Construction Methods, Equipment and Short cuts.
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- Up-to-the minute News of Your Field.

And all the vast array of information remember, costs only \$1 for 36 monthly issues—or 100 little pennies to follow the master salesman's argument.

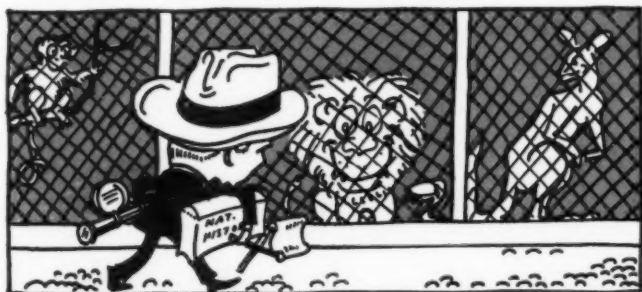
Compare in your own mind the good you will get from \$1 invested in *Construction Methods* with the returns upon the same sum spent in any other conceivable way. Only one answer is possible—

**You Should Read *Construction Methods* Each Month
Use the coupon on the next page—NOW**

Construction Methods

Hitting the High Spots

IT looks as though we may have to spend our vacation at the zoo and the museums instead of seeking out some sylvan retreat as we had intended to do. Our little dissertation on animals which appeared on this page last month aroused the in-



dignation of a reader who wrote us a long letter, minus a signature, in which he pointed out that we knew nothing, and in all probability less than nothing, about Eskimo dogs and totem poles. He says that he lived in Alaska for 27 years and knows what he is talking about. So it's back to the natural history class for us.

DESPITE this blow to our pride, we have gone right ahead with the job of getting out the September issue, and here it is. Look it over and let us know what you think of it. As we have said



before, we try to give you each month a cross-section of the construction field. This particular cross-section reveals roads, bridges, buildings, tunnels, lighthouses, sea walls, pipe lines, docks and mine shafts. That's fair enough, isn't it?

IN regard to the roads, do you remember the statement of Thomas H. MacDonald, Chief of the Bureau of Public Roads, in the January issue? He said: "In my judgment the most pressing highway problem with which we are now confronted is that

of relieving congestion and providing for the uninterrupted flow of traffic in the vicinity of the large cities. The conditions requiring immediate relief are found mainly in the East; and the principal need is the construction of bypass roads to carry through traffic around the cities."

A GLIMPSE of the way in which New Jersey is solving this problem will be found on pages 30 and 31, and some of the work going on around Detroit appears on pages 38 and 39. Next month we



expect to have articles from Rhode Island and Ohio showing what they are doing.

WHAT should a contractor's office look like? There are dozens of answers to that question, and a rather pleasing one will be found on pages 32 and 33. The pictures on those two pages show the offices of John Gill & Sons in Cleveland, an organization that has done important work in various parts of the country for many years.

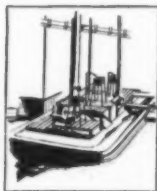
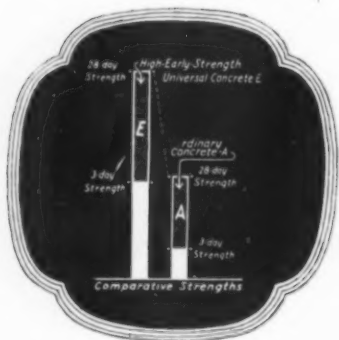
And don't forget the advertisements. The vice-president of one of the biggest construction companies in the country recently wrote us a letter in



which he said that he thought the advertisements were even more interesting reading than the reading pages. Perhaps he is right. Look over the ads and see for yourself.

first Aid in construction Emergencies

Typical Examples of Problems Solved with High-Early-Strength Universal Concrete



An Indiana packing company wished to replace the floor in its killing room but did not want to incur the expense of interrupting operation during working hours. *High-Early-Strength Universal Concrete* provided the floor over the week-end.

Quick repaving of Duluth's principal industrial street with a minimum of traffic delay presented a problem. *High-Early-Strength Universal Concrete* solved it.



A hospital driveway in Iowa had to be rebuilt. Long and serious tie-up was avoided by *High-Early-Strength Universal Concrete*.

A Chicago loading platform had to be replaced without interference with loading; the new.



Northwestern University stadium had to be ready for use at the opening of the football season to avoid a 50c-a-seat penalty to the contractor; a West Virginia road used by 5,000 motorists a day had to be repaved with minimum inconvenience to traffic. In each case, *High-Early-Strength Universal Concrete* solved the problem.



High-Early-Strength Universal Concrete is made with the usual labor, usual materials, usual equipment and standard—not special—Universal cement, all applied according to fully tested methods. Having a higher ultimate as well as a higher early strength, it also is permanently better and stronger concrete. For full details send in the accompanying coupon.



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Without obligation, please send me detailed information on methods of securing strong concrete in 3 days with the usual materials and equipment.

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Construction Methods

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A Monthly Pictorial of Field Practice and Equipment Illustrating Successful Construction, Maintenance and Material-Handling Methods for General Construction, Highways, Buildings, Industrial Plants and Public Works and Utilities

WILLIAM JABINE,
Editor

VOLUME 9

NEW YORK, SEPTEMBER, 1927

Number 9

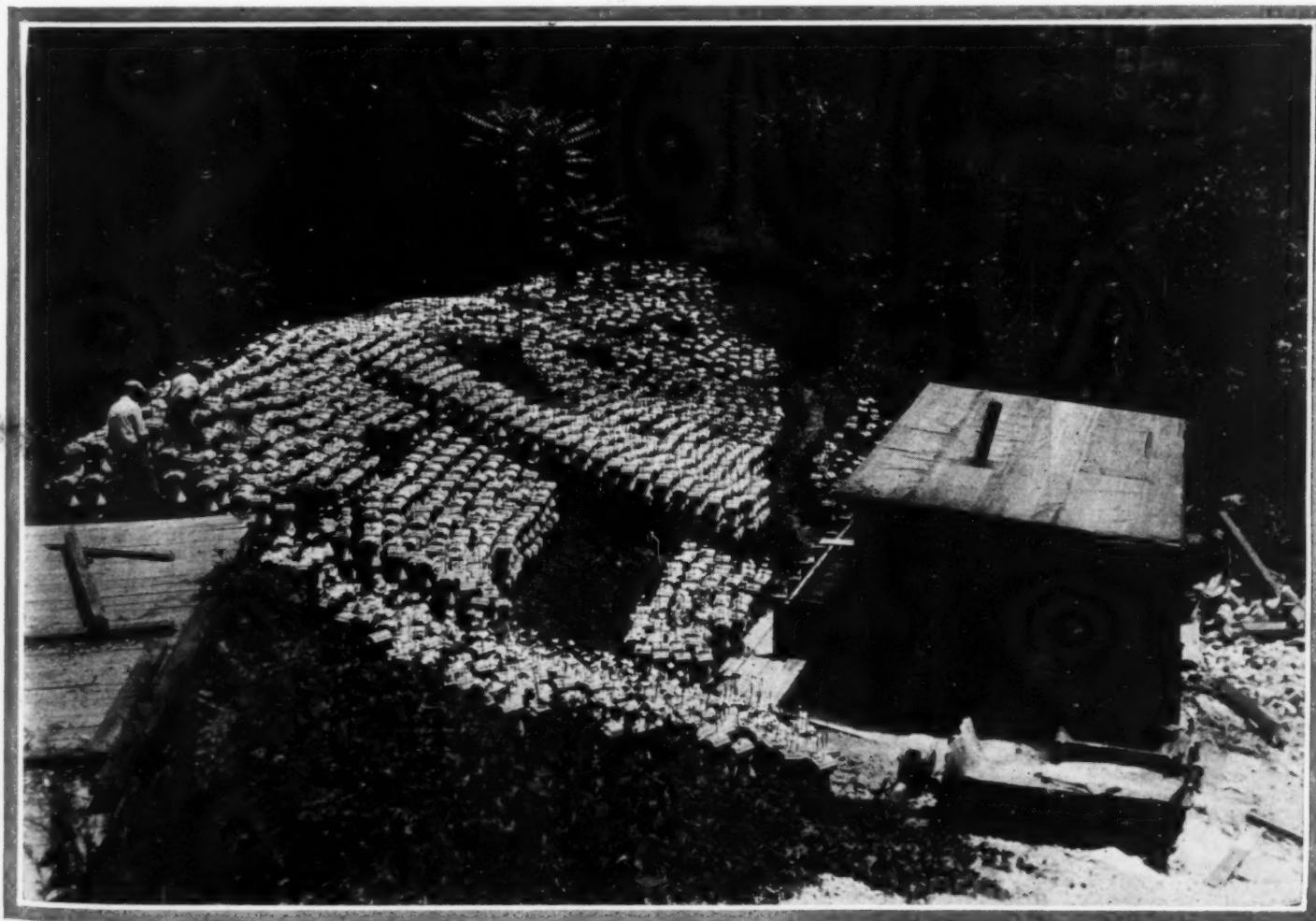
A Contractor's Flower Garden

THROUGH necessity rather than from choice the average contractor has to tear the scenery into small pieces when he undertakes a construction job. While the work is under way he has to sacrifice appearances, and it is a rare thing to find even a trace of beauty anywhere on the premises.

The exception to this rule was encountered recently by a field representative of *Construction Methods* who visited the bridge which the Hardaway Contracting Company is building over the Congaree River at Columbia, S. C., and which is described on pages 25-28 of this issue. During his inspection of the job, camera in hand, he came upon a little hollow in

the river bank near the end of the bridge which looked like a garden of white flowers in full bloom. Another look revealed the fact that what seemed like flowers were the concrete balusters for the new bridge which were being cast well in advance of the time when they would be used and were being stored in the little hollow on the river bank. He took a photograph of the scene and it appears on this page.

And after all, it should look like a garden, for the word "baluster" is derived from the Latin word for the flower of the wild pomegranate. Balusters were so named because of their resemblance in form to this flower.

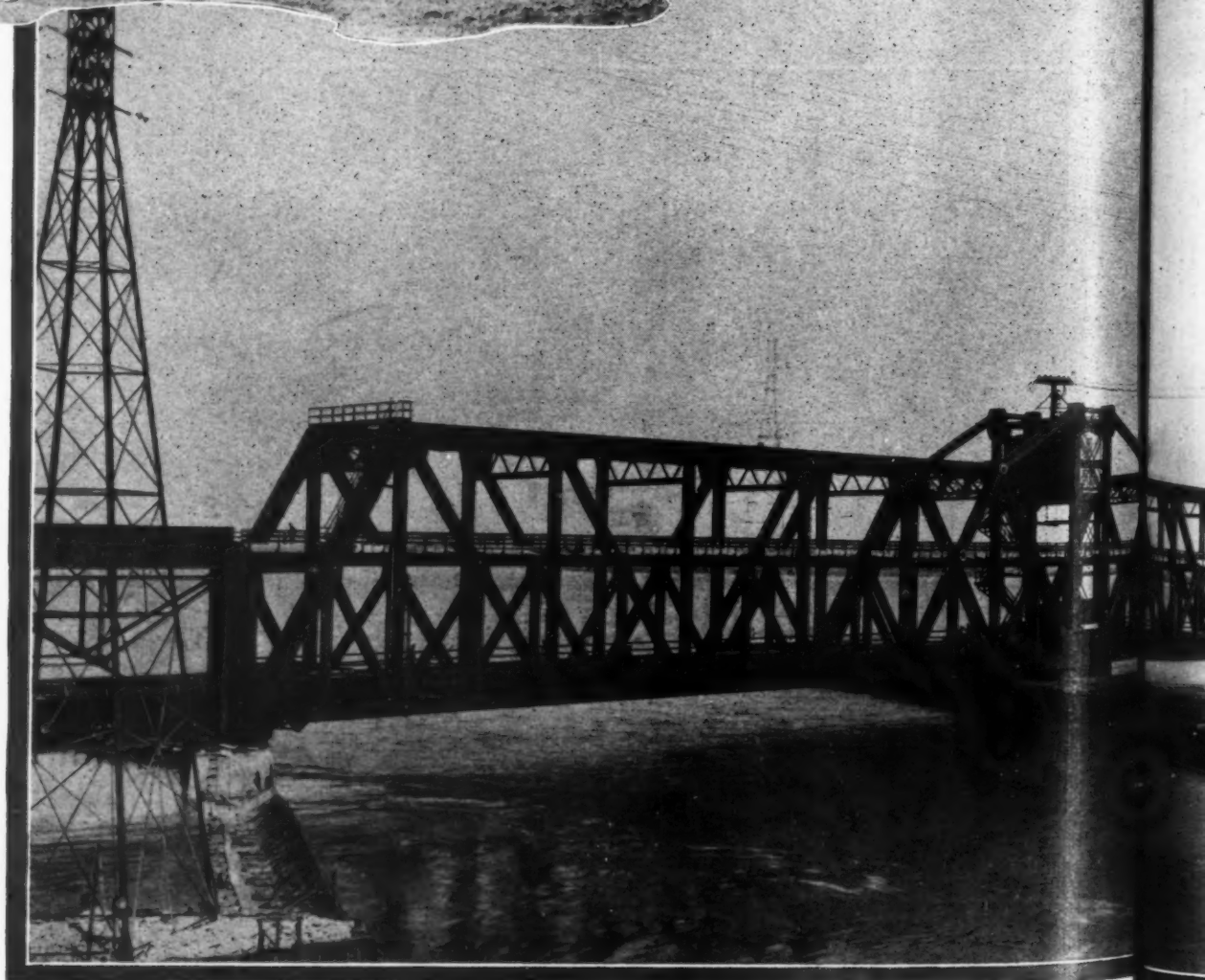


Highlights of C



This oil derrick with the aid of a Caterpillar tractor wanders from one oil well to another in northern Montana. The derrick is 75 ft. high and 20 ft. square at the base, but the contractor has no difficulty in moving it. It weighs, with tools and equipment, about 36 tons

The new Santa Fe bridge across the Mississippi at Ft. Madison, Iowa, was recently opened to traffic. The new structure is a double-deck affair, the upper deck being devoted to highway traffic. The approach and piers were built by the Union Bridge Company of Kansas City, Mo., and the upper steel work and draw were built by the American Bridge Company of Chicago. The bridge cost more than \$5,000,000



of Construction

One of the latest additions to Chicago's skyline is the Mather Building, which is nearing completion. This structure, designed by Herbert H. Riddle and built by William A. Illsley, is 524 ft. in height. Work began in July of last year

Vice-President Dawes and the Prince of Wales shaking hands over the international boundary at the ceremonies in connection with the official opening of the Peace Bridge across the Niagara River between Buffalo and Ft. Erie. The white ribbon is supposed to mark the two boundaries, so it is evident that the Vice-President reached well over into Canada to greet the Prince



© International



Paving Mixer Used to Build S

Three Machines on Job—One Moves Along the Line Casting Piles

THREE concrete paving mixers are being used to build 10 miles of step-type sea wall at Gulfport, Miss. For about 7 miles the wall is 11 ft. high and for the rest of the distance the height drops to 8 ft. The step slab is supported at top and center by 12 x 12 piles. At the foot it rests on a cutoff wall of 7 x 36-in. sheet piles with grouted joints.

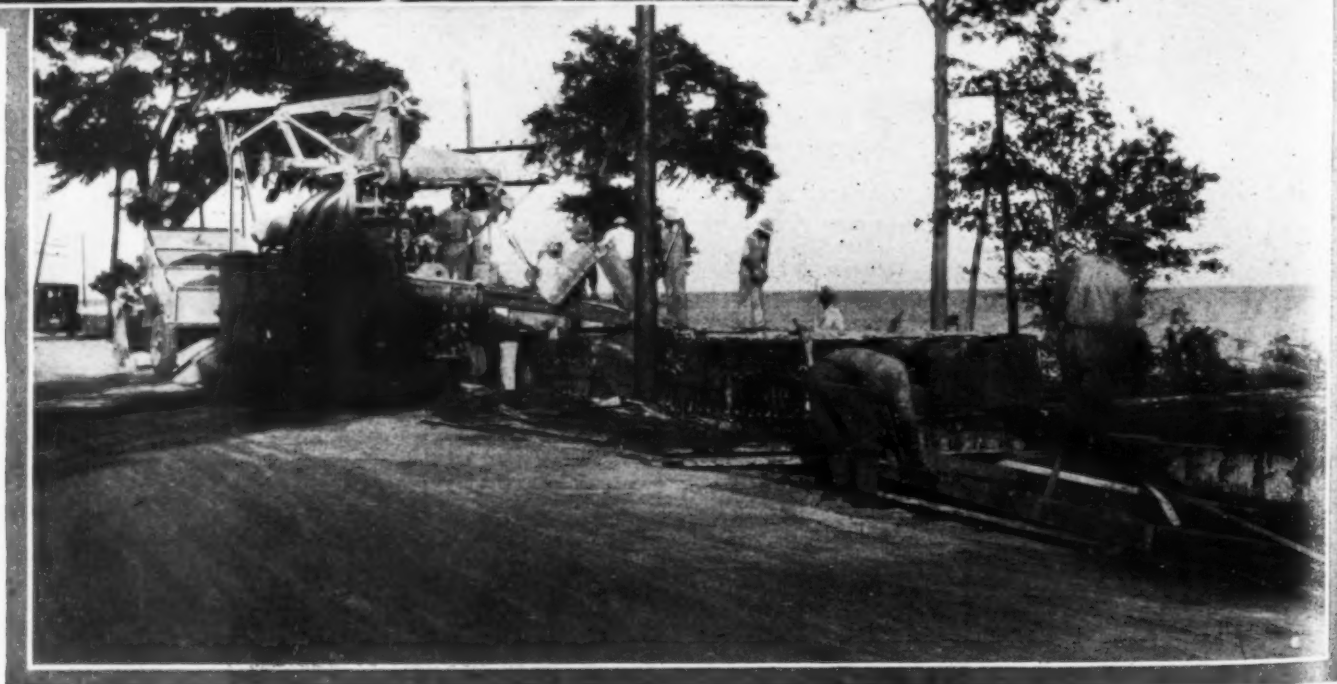
Two of the pavers, each of 32-cu.ft. capacity, are being used to pour the step slab and the 5-ft. sidewalk which runs along the top of the wall. The third mixer, a 21-cu.ft. machine, is producing the concrete for the piles. The mixer is moved along the line of the wall, and the piles are cast at the spot where they are to be set. One of the photographs shows piles being cast, with a batch truck dumping materials on the pan. All three of the mixers are Koehring's.

The practice of casting the piles near the point at which they are to be used is proving more satisfactory than the method sometimes followed of casting all the piles in a central yard and hauling them from that point to the job. In the construction of the sea wall, the contractor, C. F. Lytle of Sioux City, Ia., has located the material yard at Gulfport, approximately the mid-



At left—Sidewalk forms and reinforcing steel in place. Paving mixer in background

Below—This mixer moved along the line casting piles wherever they were needed



ld Sea Wall

point of the job. Twenty 2½-ton trucks haul the batched materials to the mixers.

The protection of the coast highway is one of the purposes for which the wall is being built. At some places the wall and the road approach each other closely, but along most of the 10 miles the trucks have to be taken across sand beach on planks. The situation, however, greatly favored the use of trucks rather than industrial railway. Handling batched materials is easier than hauling piles. It also obviates possible damage to piles.

The photographs give a clear idea of the type of construction. Cranes and jets are used in placing the piles. Drainage structures are installed at intervals of 200 or 300 ft. The slope is filled in by dredge, and steel reinforcing is laid. The forms for the steps are in 28-ft. sections, running on travelers.

C. L. Mosher, southern representative of C. F. Lytle, Gulfport, Miss., is supervising operations. Robert Folsom is superintendent. The chief engineer for the Sea Wall Commission is H. D. Shaw, Gulfport, Miss.

At work on the seawall.
Above — Traveling steel
form. In center—Grouting
the joints. Below—Jetting
sheet pile into place



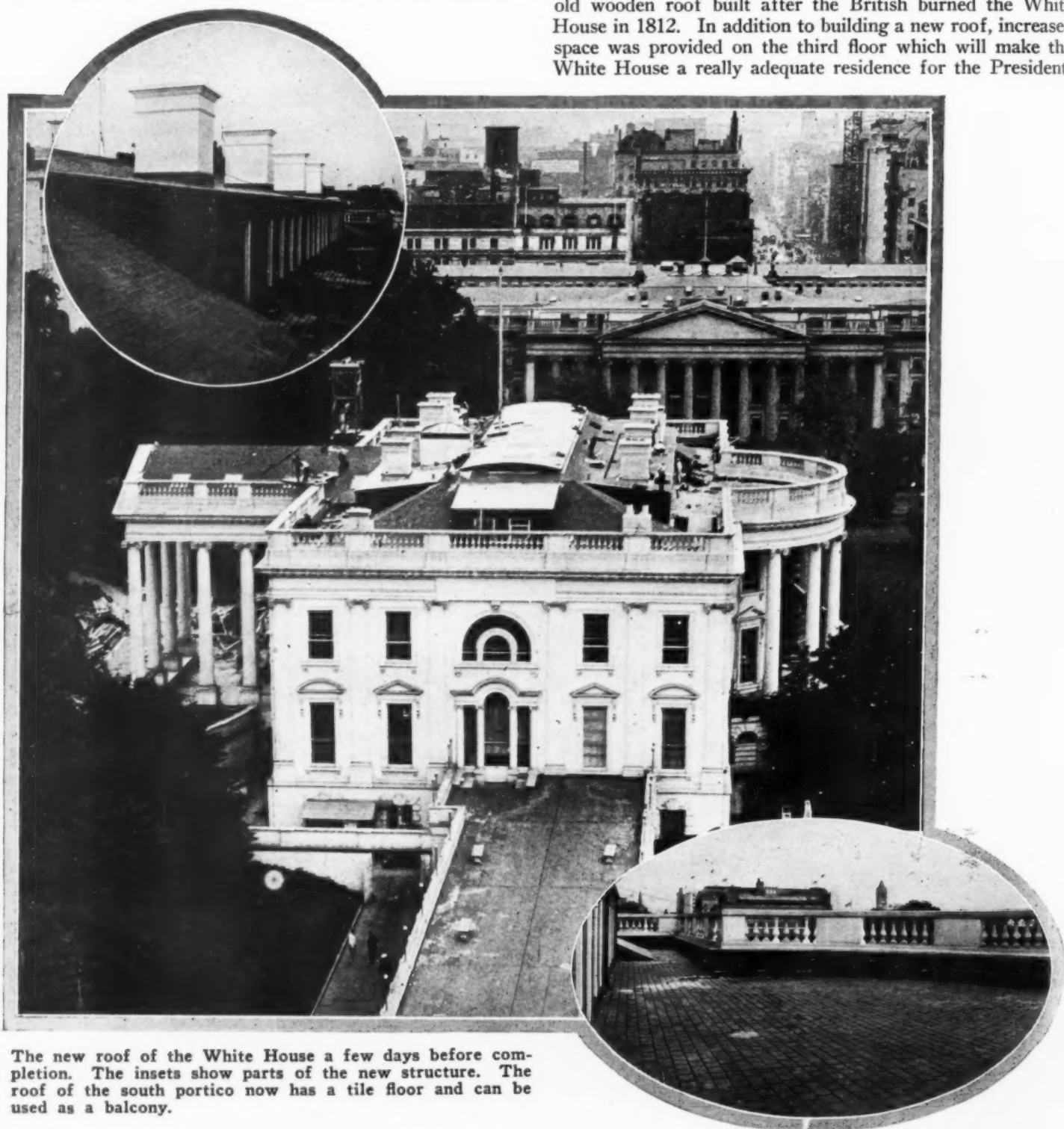
White House Ready for President's Return

New Steel Roof Replaces Old Wooden Structure
Which Has Done Duty Since 1812

ANNOUNCEMENT has just been made that the work of rebuilding the White House roof has now been completed. An article in the May issue of *Construction Methods* described in considerable detail the repairs which were being made. At that time it was stated that the contract called for the completion of the job in 125 calendar days which would have made the time limit expire on July 16. As the job proceeded, however, it was found that extra work would be necessary which was not contemplated when the

contract was let, so the time was extended. The contractor, N. P. Severin Company of Chicago, finished its work on August 12, a few days ahead of time under the provisions of the extended contract. Most of the work was done under the direction of W. F. Lusk, superintendent for N. P. Severin Company. He left on July 15 in order to take another position, and the White House job was completed under the direction of F. Berton Ridenour.

The new roof is of steel construction and replaces the old wooden roof built after the British burned the White House in 1812. In addition to building a new roof, increased space was provided on the third floor which will make the White House a really adequate residence for the President.



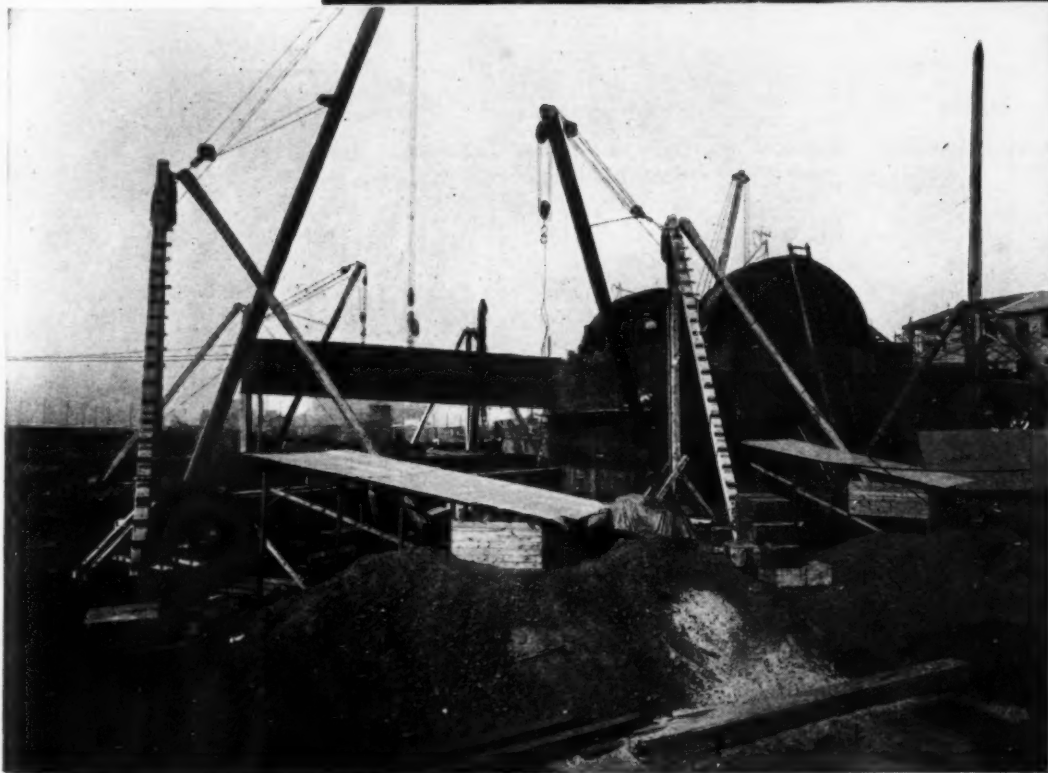
The new roof of the White House a few days before completion. The insets show parts of the new structure. The roof of the south portico now has a tile floor and can be used as a balcony.

**Holland Vehicular Tunnel
Under the
Hudson River
between
New York and
Jersey City**



The late Clifford M. Holland, Chief Engineer of the Vehicular Tunnel, who died while the work was in progress. He is shown at the left with G. H. Flinn, secretary and treasurer of Booth & Flinn, Ltd., the contractor, at the right. They are breaking ground for the Jersey City land shaft

At right—The New York end of the tunnel in the early stages of construction. Taken Sept. 8, 1921



At left—Work on the land shaft caissons at the New Jersey end. This picture was taken Nov. 3, 1922



BLUE BOOK



Holland Vehicular Tunnel

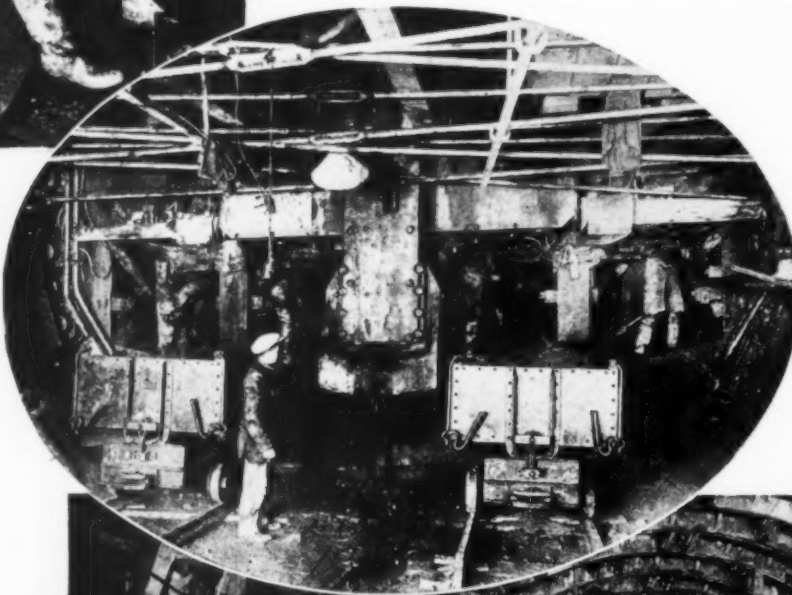
THE tunnel comprises two tubes, one for east-bound and the other for westbound traffic. They are the largest tunnels giving access to New York, their outside diameter being $29\frac{1}{2}$ ft. and the roadway width 20 ft.

The tubes were built for nearly their full length through Hudson River silt by using the shield method and compressed air. The shells are made up of cast-iron or cast-steel segments bolted together in rings $2\frac{1}{2}$ ft. wide. Concrete lining and glazed tile cover the inside of the shell.

Contracts for the tunnel were awarded to Booth & Flinn, Ltd., on March 28, 1922, and this company completed its work about six months ago. Paving, tiling, and installation of electrical and ventilating equipment are now in progress. The tunnel will be opened some time this fall.



©Keystone
Above—Tightening bolt in the north tunnel



At left—Removing material from the tunnel in small cars

At right—A curve in the south tunnel under West Street, New York, showing tube construction



©Keystone



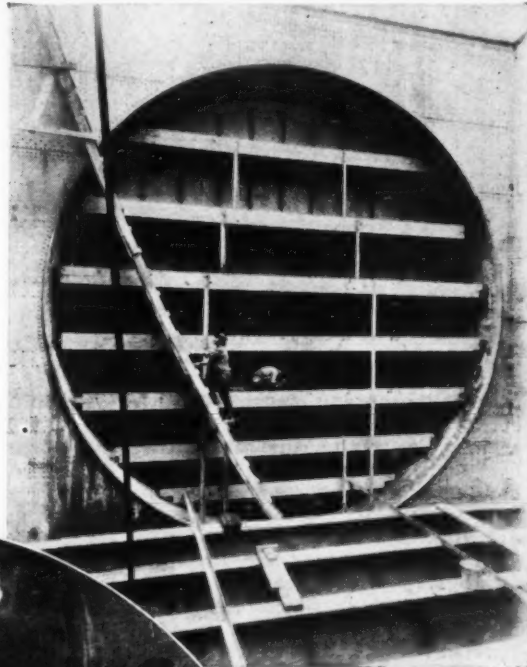
BLUE BOOK



Holland Vehicular Tunnel

THE construction of the tunnel has claimed the lives of two chief engineers, Clifford M. Holland and Milton H. Freeman. Mr. Holland died on October 27, 1924, just two days before the headings of the north tube met under the river. The engineer of construction, Mr. Freeman, was appointed to fill the vacancy. Overwork so impaired Mr. Freeman's health that he, also, fell a victim of disease, his death occurring March 24, 1925.

At a joint meeting of the tunnel commissions, November 12, 1924, the tubes were officially named the Holland Tunnel, in honor of the engineer who had exerted strong influence and untiring effort in designing and building them. The cast-iron ring construction and the tile lining are both the result of Mr. Holland's decisive arguments. Ole Singstad succeeded Mr. Freeman as chief engineer.



Above — Tunnel opening in shaft wall of Spring Street caisson



At right—The paving gang at work under the river



At left—The interior is lined with tile. This picture shows the work under way

© P 4 4

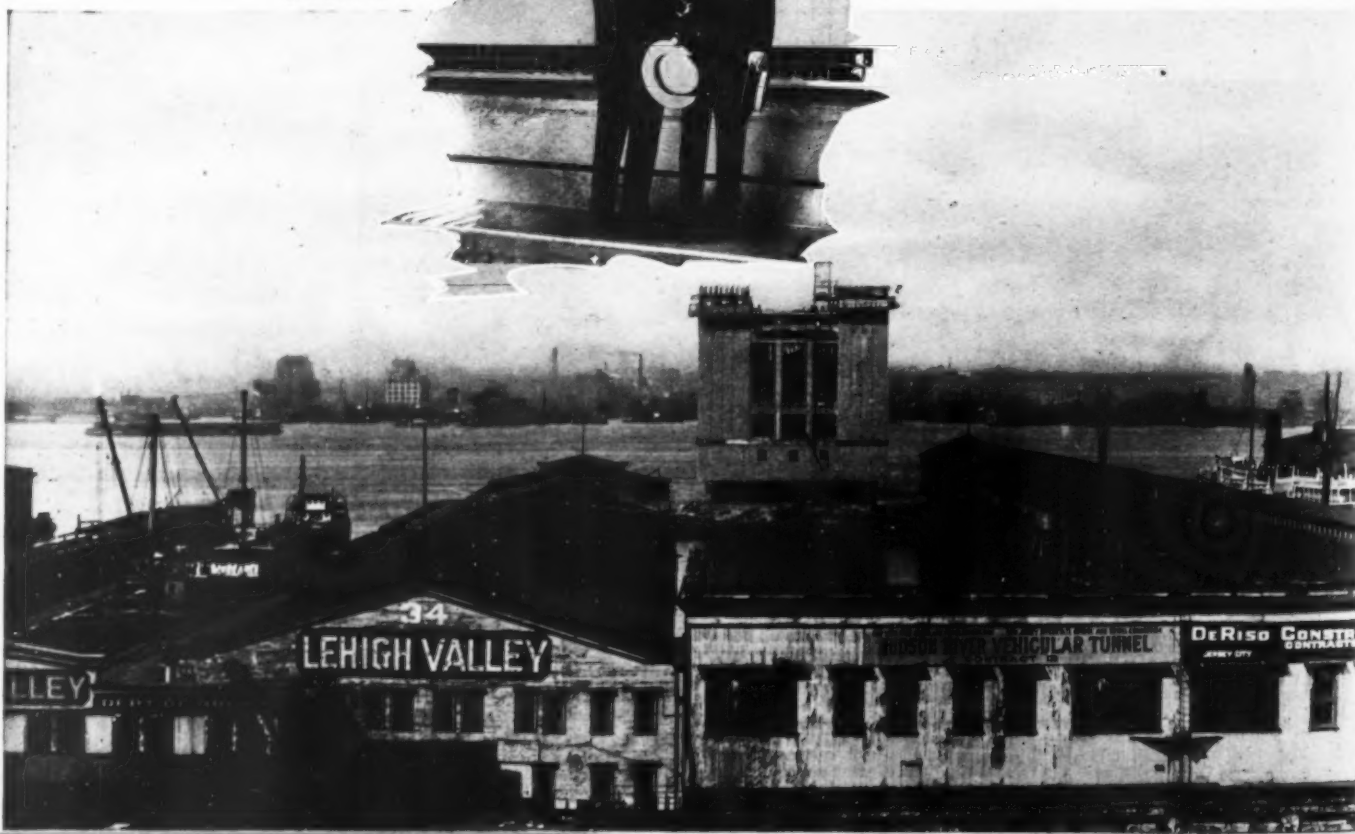
BLUE BOOK

Holland Vehicular Tunnel

Few jobs have been inspected so thoroughly by officials, engineers and other delegations as the Holland tunnels. Governor Smith of New York and Governor Moore of New Jersey are shown in the center photograph shaking hands across the state line on one of their visits to the tunnel. In the five years during which the tunnel has been under construction, both governors have made more than one visit to see how the work was going on. Governor Smith comes from New York and Governor Moore from Jersey City, so both men are interested from a city as well as from a state standpoint



The ventilating towers are the only evidences of the tunnel which appear prominently above ground. There are four of them, two in the river and two on shore. The photograph at the left shows the land ventilation building on the New York side practically completed, and the picture below shows the ventilator in the river under construction, with the brickwork complete to the level of the lower roof. The shafts under both of these buildings were sunk to natural soil and rock. They are rectangular steel caissons with double walls filled with concrete. The contractor for the two buildings was the De Riso Construction Company



Belgian Church Built of Concrete

**Impressive Structure
Has Exterior Walls
of Masonry**



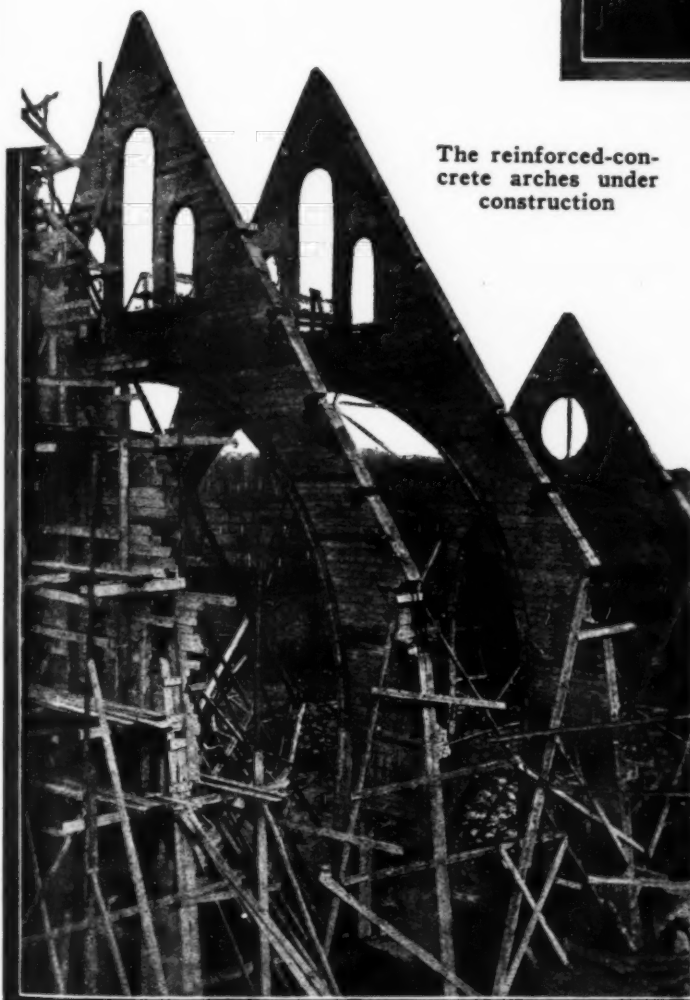
A CHURCH built recently at Bléharies, Belgium, is an excellent example of some of the work which is now being done in Europe. The building itself consists of a great rectangular hall without transept or apse. The entire structure is of reinforced concrete with exterior walls of masonry. The roof, which is made of precast materials, is supported upon purlins which in turn are supported by six large arches. The last arch of the nave is joined to the small arch of the choir

by a single vault. All of the furnishings of the church are of reinforced concrete with an imitation stone surfacing. The panelling is made of slabs of cement polished and tinted red, green and black.

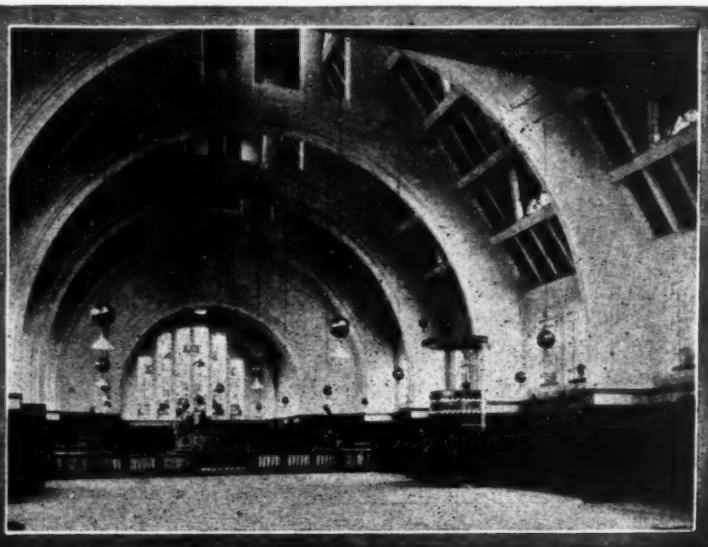
The main architectural feature of the building is an octagonal bell tower at the right of the entrance which faces the principal street of the village.

The architect for the new church is H. Lacoste. It was built by M. Vandeghen.

The reinforced-concrete arches under construction



Interior of the church showing use of concrete for decoration



October Photographic Contest

*Three Prizes for Photographs
of Construction Work*

First Prize \$25.00—Second Prize \$15.00—Third Prize \$10.00

Entries close Saturday, September 10

A Highway Bridge in the Ozarks



H. M. Werbitzky
Project Engineer
Missouri State
Highway Dept.
Vienna, Mo.

Wins
First Prize
of
\$25.00



The prize pictures show various stages in the construction of the Gasconade River bridge on U. S. Route 63 in the Ozark section of Missouri. All materials are hauled in trucks a distance of 20 miles to the bridge site over some extremely bad roads. The Vincennes Bridge Company of Vincennes, Ind., has the contract

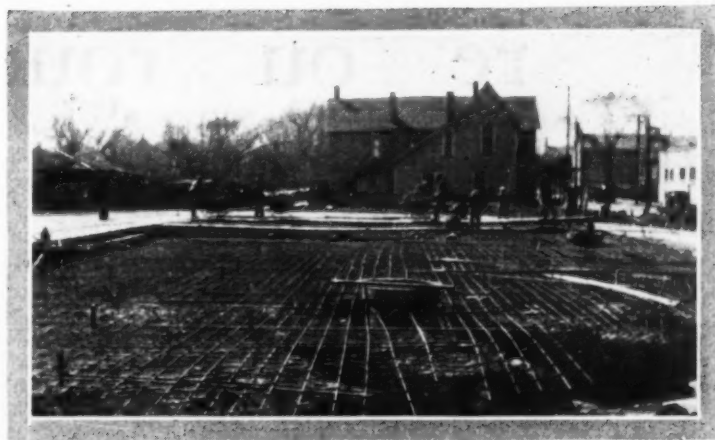


The bridge will be 905 ft. long and is of the deck type. The center span is suspended from the cantilever ends of the two 240-ft. spans, one of which is shown in the photograph at the left. At the time this picture was taken this span was practically finished

Erecting a Gas Holder



1. At left—Driving the last pile on the holder foundation



2. At right—Pouring concrete in the holder foundation. Stakes in the foreground are set to grade

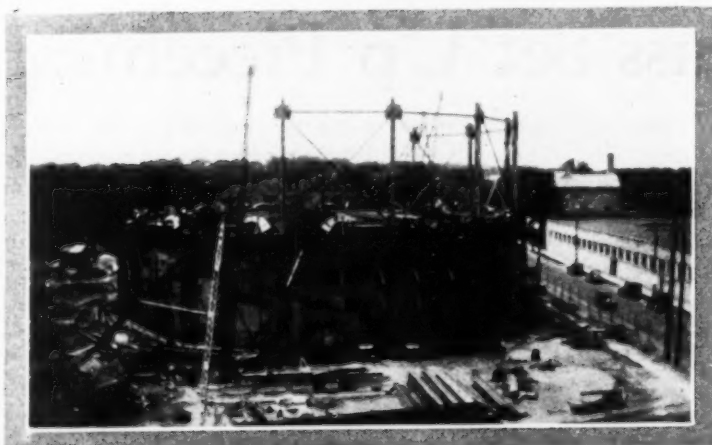


3. At right—Riveting on bottom of holder nearing completion

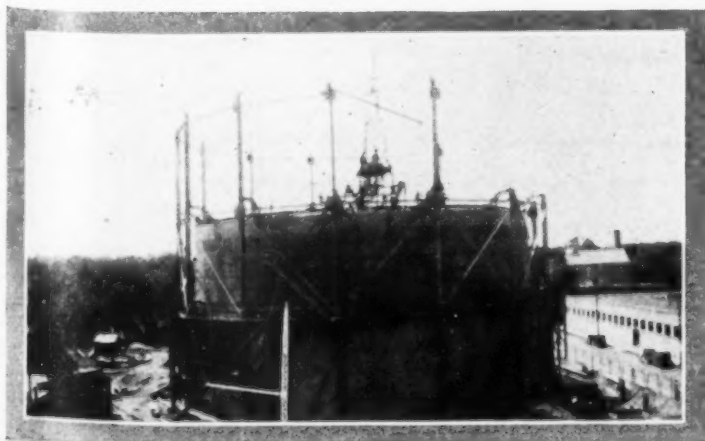
H. W. Jackman
Chemist
Battle Creek
Gas Company
Battle Creek,
Mich.

Wins
Second
Prize
of
\$15.00

4. At right—Erecting the first section of guide frame

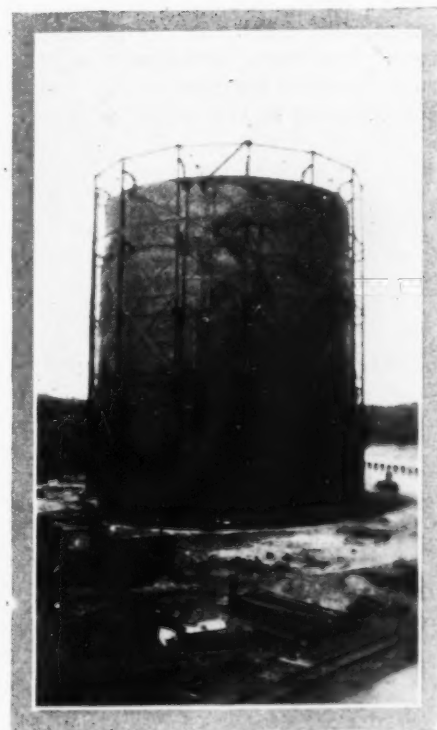


5. Below—Second section of guide frame going up



This gas holder was built by the Stacey Manufacturing Company for the Battle Creek Gas Company, at Battle Creek, Mich. It is 165 ft. high and 133 ft. in diameter. Construction of the steel work was put through in 89 working days

6. Below—The completed gas holder



Are You Proud of Your Job?

THE constantly increasing list of subscribers to *Construction Methods* proves that the men out in the field are anxious to know what is going on in the great construction industry. Give them a chance to see your job. Don't feel that the other fellow is not interested in what you are doing.

IF YOU are proud of the work that you are doing, let others have a look at it. Dig out your camera, take a picture, and enter it in the October contest.

REMEMBER there are three prizes: First, \$25.00; Second, \$15.00; Third, \$10.00. Win one and prove that there is money in the construction business after all.

THE conditions are stated herewith: Photographs must be taken by a man actually employed on the job and should be sent to *Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Saturday, September 10, and plainly marked Photographic Contest. Photographs received after that date will be entered in the November contest. *Construction Methods* will pay for all non-prize-winning photographs which it uses.

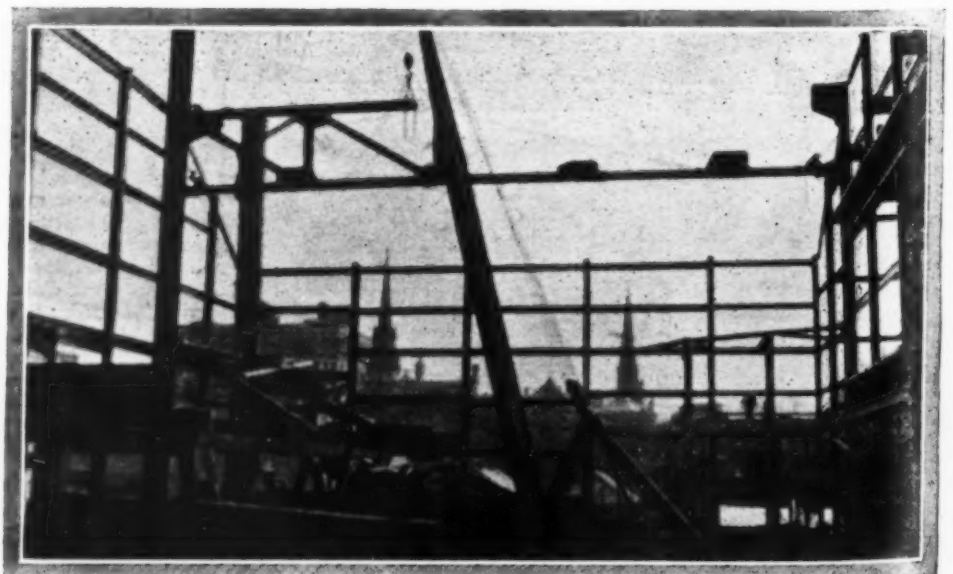
Roof Truss Set Up Piecemeal

AN UNUSUAL method of erecting a roof truss was used recently on the Capitol Theater at Madison, Wis. The derrick was a stiff-leg and was so placed that one of the legs prevented the boom from swinging to the center of the truss. The truss, therefore, was partly built on the balcony truss shown in the photograph and the cable was tightened from one end to the other over one of the legs to keep the

camber in the lower chord. The truss was then picked up at the balancing point and the connections made. A shore was then erected from the roof truss down to the balcony truss, after which the derrick let go and filled in the remaining parts. The camber held so nicely that no trouble was encountered in making the holes. The whole operation proved very successful.

V. L. Cooley
Architect's Superintendent
Minneapolis, Minn.

WINS THIRD PRIZE
OF \$10.00



Concreting Shaft in Nevada Consolidated Mine

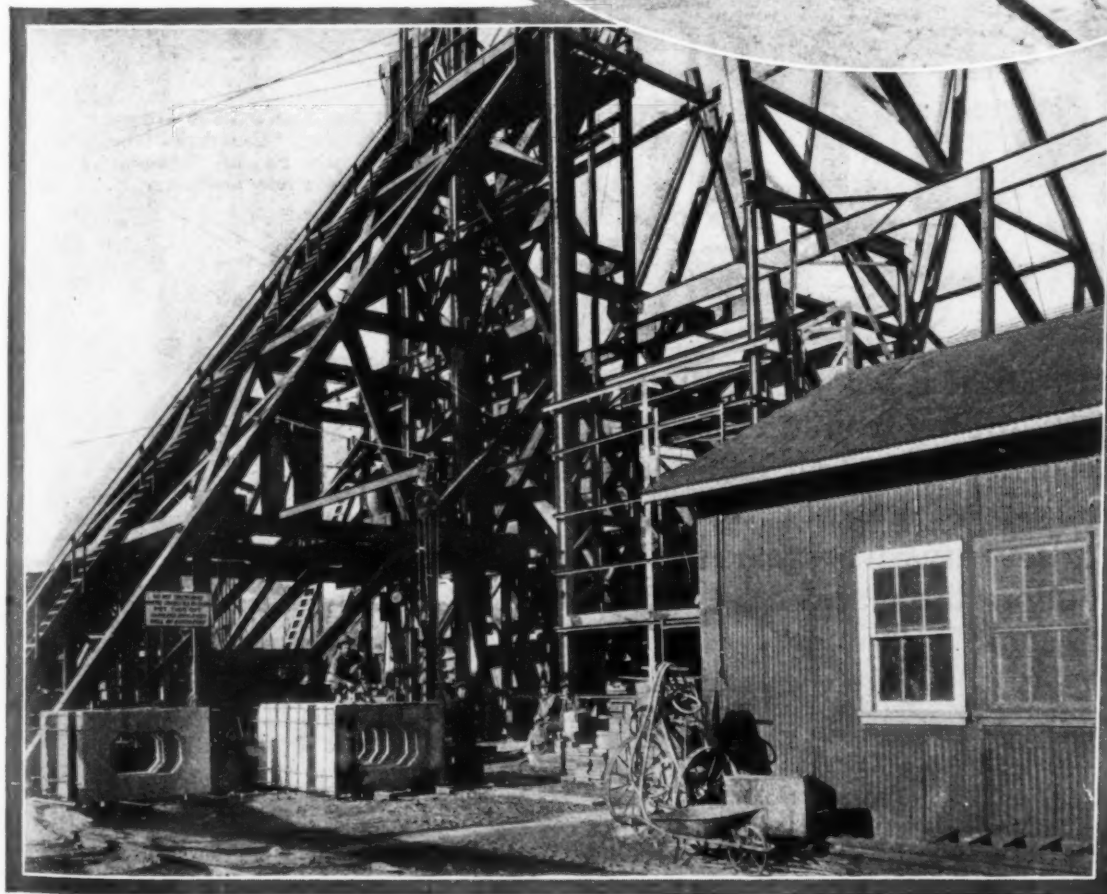
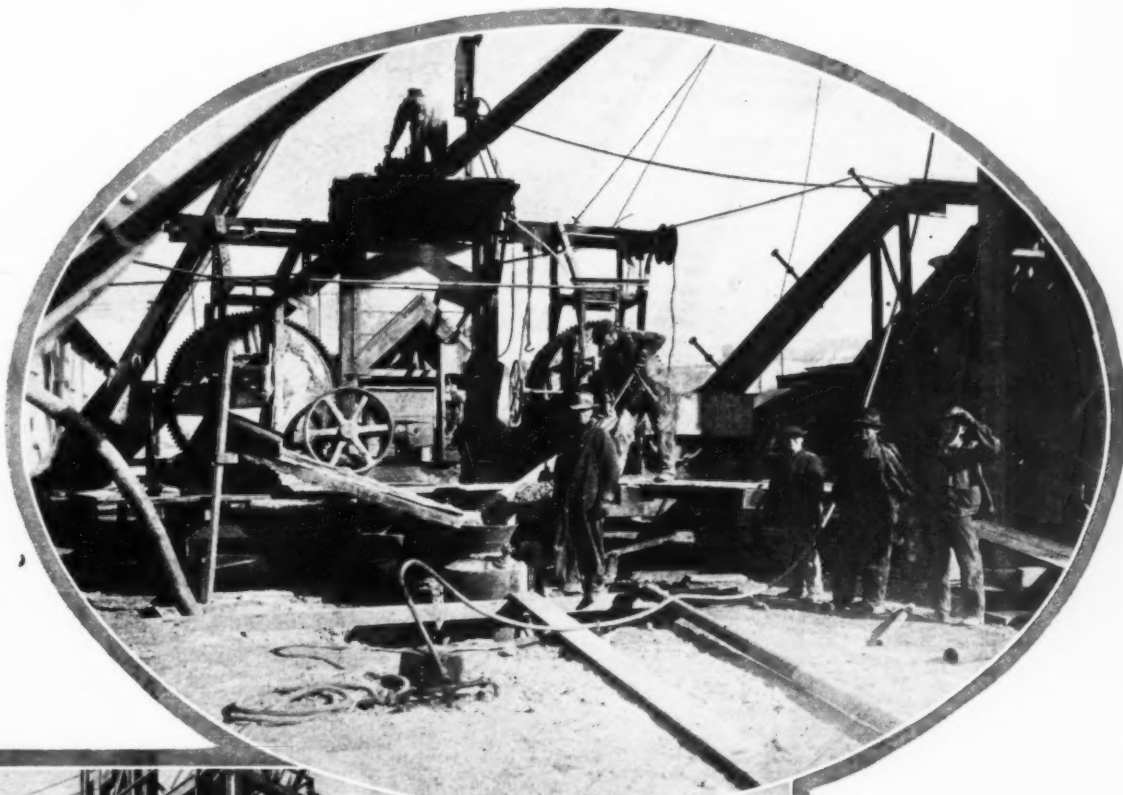
THE new wedge shaft of the Nevada Consolidated Copper Company mine at Ruth, Nevada, was concreted from top to bottom recently, but the equipment used on the job is shown in the accompanying photographs. The shaft is 650 ft. deep, and one of the largest hoists ever built is being constructed at the top of the shaft.

The shaft will have duplicate skip compartments, and because of the material through which it was driven, the con-

crete lining had to be made thicker than is usual in this sort of work. The job was handled with a cement gun, and this method of placing the concrete proved wholly satisfactory.

The new shaft has been driven in accordance with the policy of the Nevada Consolidated Company to cease steam shovel and pit operations within the next few years. In the future the mine will be operated through the shaft instead of by the old method.

Cement mixer and cement gun used in concreting wedge shaft of Nevada Consolidated Copper Company mine



Erecting the superstructure for the hoist which will be operated in the new shaft. The shaft is 650 ft. in depth

Confidence

**Anderson Brothers
Contractors**
800 N. COTTON AVENUE
El Paso, Texas

June 10th, 1927.

J. W. Bartholow Company,
1221 So. Lamar St.,
Dallas, Tex.

Gentlemen:

The Ransome mixer and steel tower and chuting equipment you furnished us for the Blue-water Dam has been very satisfactory. With this Ransome mixer we can obtain thirty batches per hour in the face of specifications which require that the entire batch be left in the drum a full minute and thirty seconds.

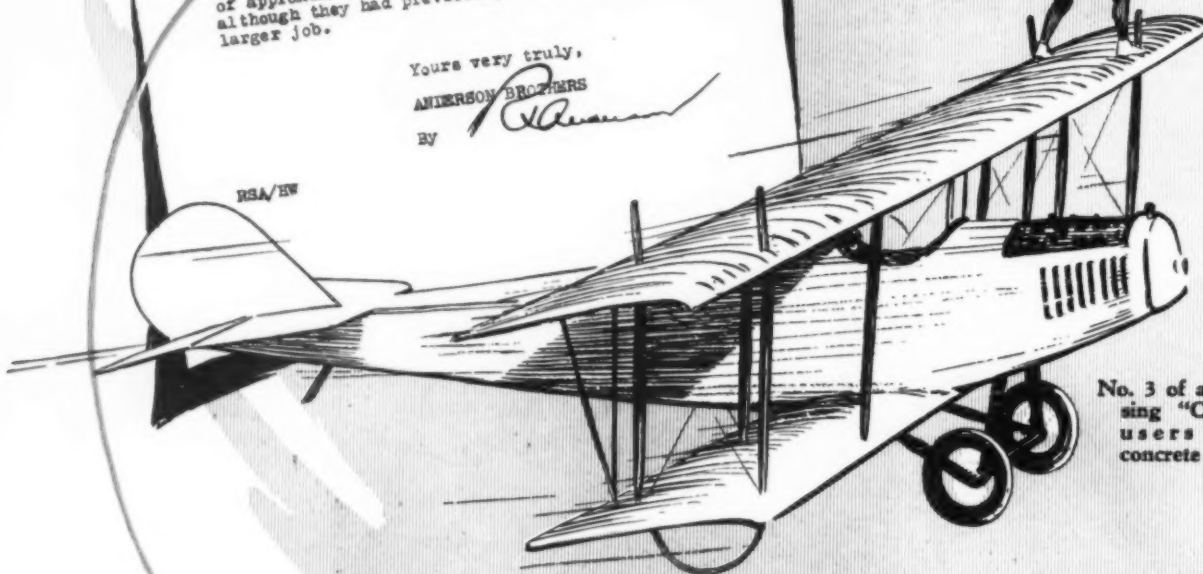
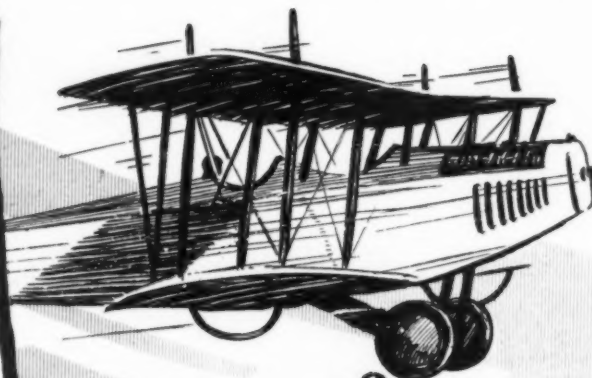
We had so much confidence in the long life of the Ransome high carbon steel chutes that we did not hesitate to install them on this job of approximately twenty thousand cubic yards although they had previously been used on a much larger job.

Yours very truly,

ANDERSON BROTHERS

BY

RSA/HW



No. 3 of a Series expressing "Confidence" by users of Ransome concrete machinery.

WHETHER it's a job of flying over the Atlantic—climbing from one flying plane to another—or constructing a great dam—the men who do the job must have utmost confidence in the equipment.

For seventy-seven years the foremost contractors throughout the world have shown their confidence in Ransome equipment.

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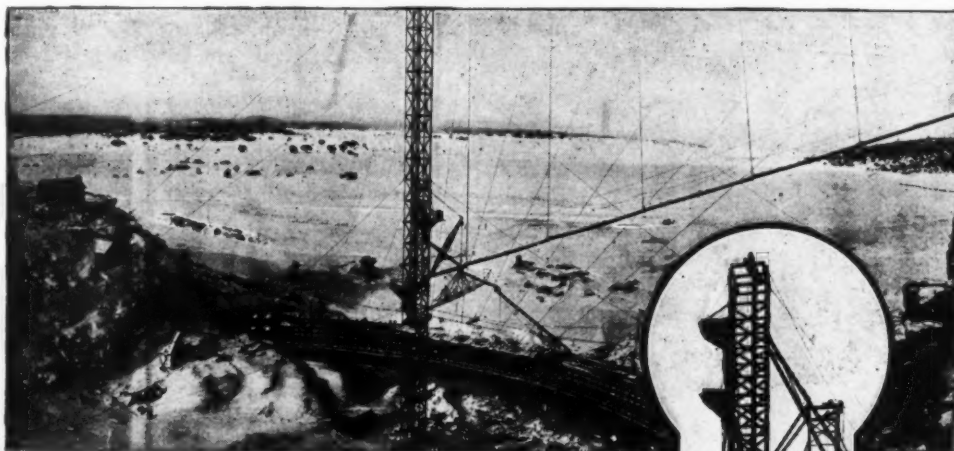
Ransome Concrete Machinery Company

1850 — Service for 77 Years — 1927

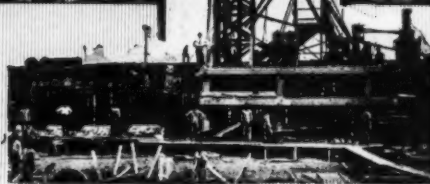
Dunellen

New Jersey

Confidence



Ransome Steel Tower, Chuting Equipment and a Ransome Mixer used on the Bluewater Dam, Texas. Anderson Brothers, Contractors.



The first portable Concrete Chuting Plant used in America—Illinois Central Warehouse, New Orleans, La. Designed by Ransome engineers.

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- C—Ransome still makes the *only* Steel Tower built strong enough to carry a Boom Plant with a 48 ft. counterweight chute, having its inner end tied down and carrying at its unsupported outer end a 48 ft. swivel head chute.

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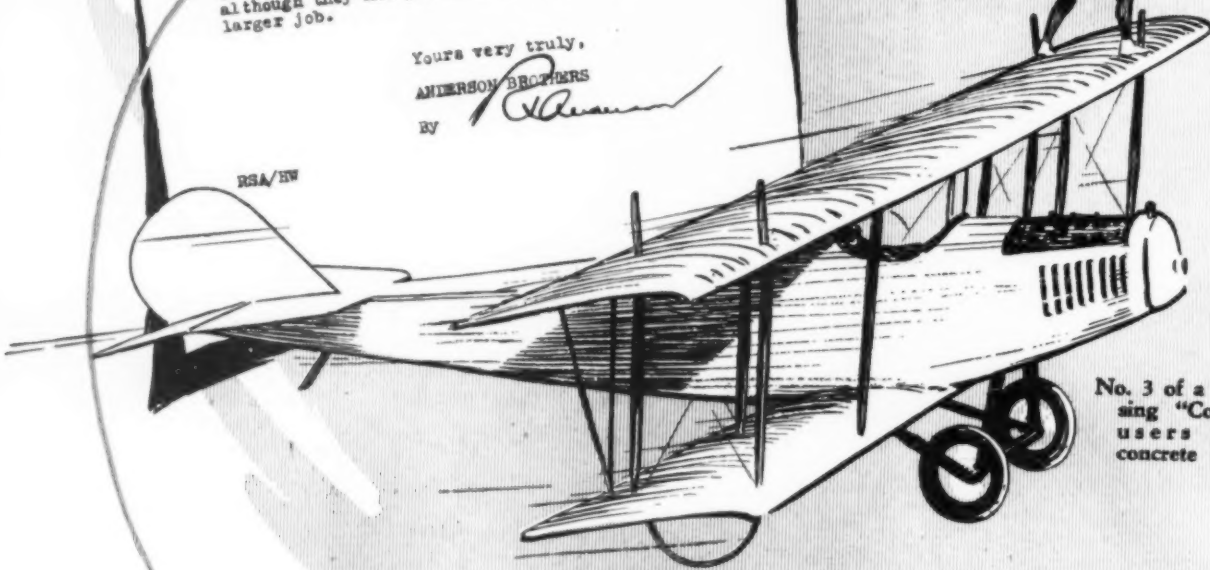
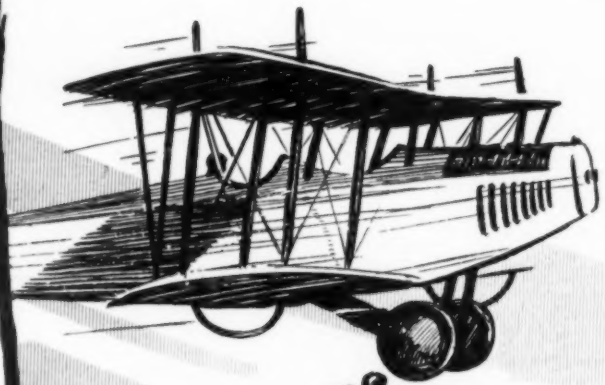
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By *R. Anderson*

RSA/HW



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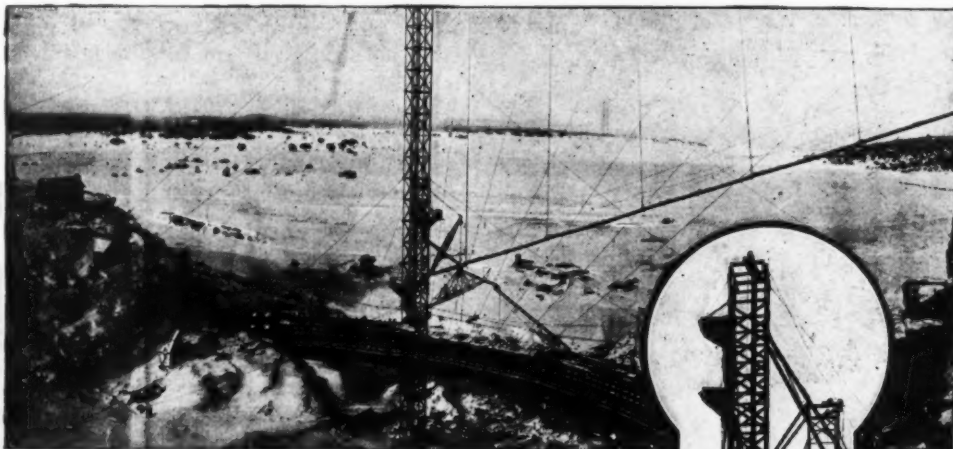
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Safeguarding Navigation on L

SHIPS navigating on Lake Erie are now depending on a new lighthouse and fog alarm station which has just been completed on South East Shoal, about seven miles off Point Pelee, Ontario. The new structure replaces the old South East Shoal lightship which has done duty for many years.

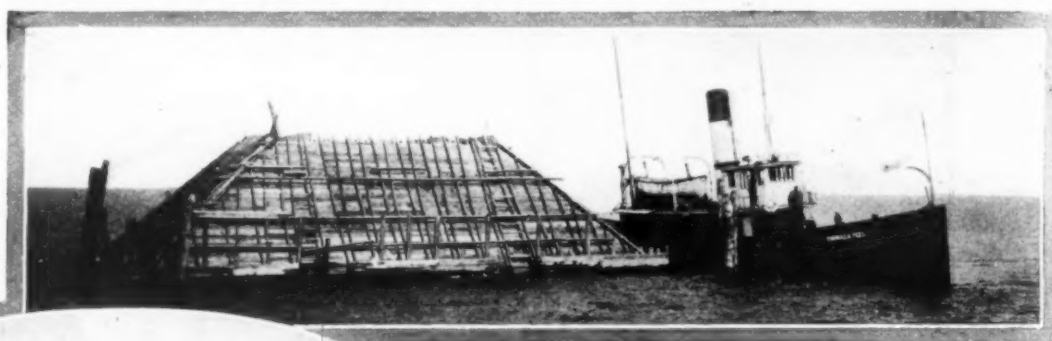
The Detroit River Construction Company, Ltd., of Windsor, Ont., built the new lighthouse. It stands in 21 ft. of water and consists of a reinforced concrete pier supported on a pile and wooden crib foundation. A superstructure,

also built of reinforced concrete, houses the lighting and fog-alarm apparatus.

The lighthouse was constructed for the Department of Marine and Fisheries of the Canadian government, which maintained constant oversight of the work during the construction period, a foreman in the department remaining on the job with the contractor's force while work was going on.

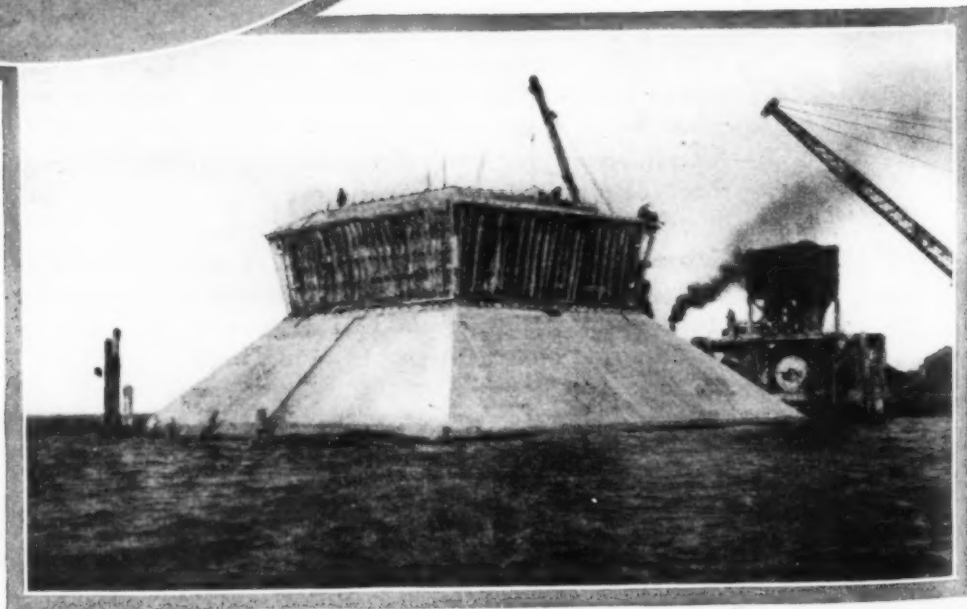
A concreting plant consisting of bins arranged over two mixers handled the work, aggregates being brought in barges. Work has been going on for the last two summers.

Towing the crib which measured 70x70 ft. to the site of the lighthouse



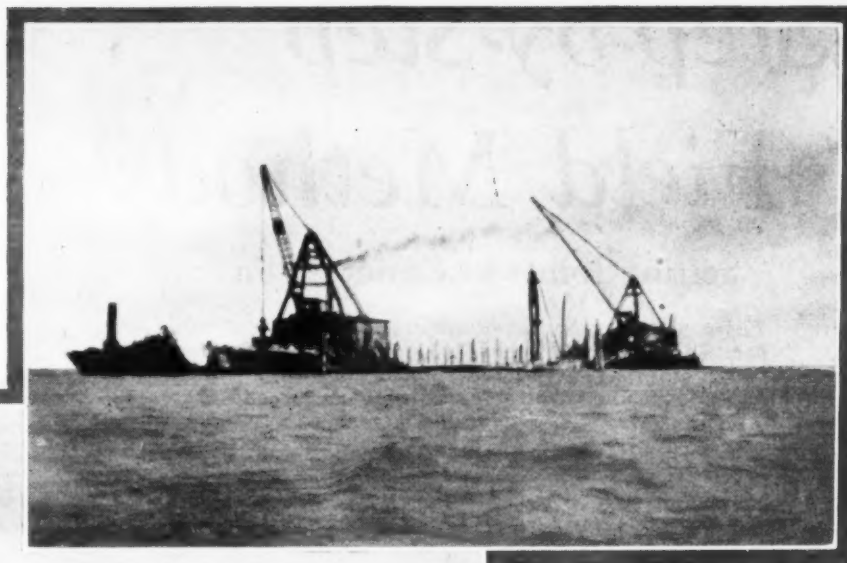
The old lightship which has just been replaced by the new lighthouse

Concrete poured up to top of battered walls of pier. Mixing plant is at the right



On Lake Erie

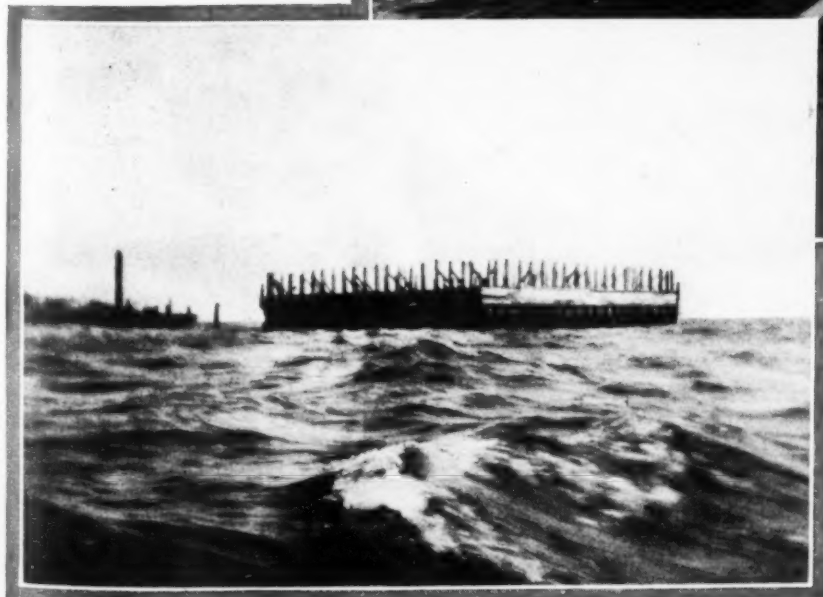
Canadian Government Builds Modern Structure to Replace Lightship



Above—Driving piles and placing stone ballast for pier of new lighthouse



At right—The new lighthouse and fog alarm station as it now appears. The water is 21 ft. in depth at this point which is 7 miles off shore



At left—The construction of the lighthouse was often made difficult by bad weather. This photograph gives a good idea of the conditions on a windy day

Step-by-Step Field Methods—

Setting Joints in Concrete Pavement

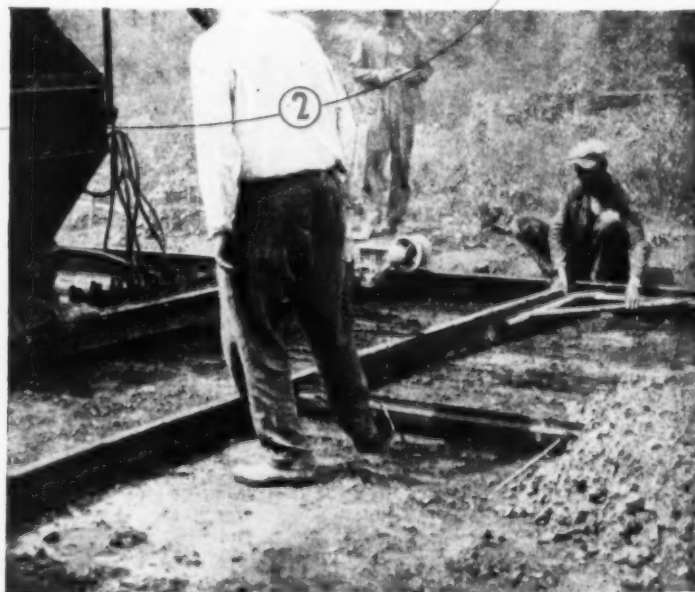
These photographs, taken on a paving job at Clinton, Tenn., handled by the Billiter & Oliver Bros. Construction Company, show an excellent method of setting joints without interfering with the expeditious and steady progress of the mixer

Follow the Red Line

1. When the mixer is moved ahead and clears the end of the parting strip, the strip is keyed in place with an extra pin or two

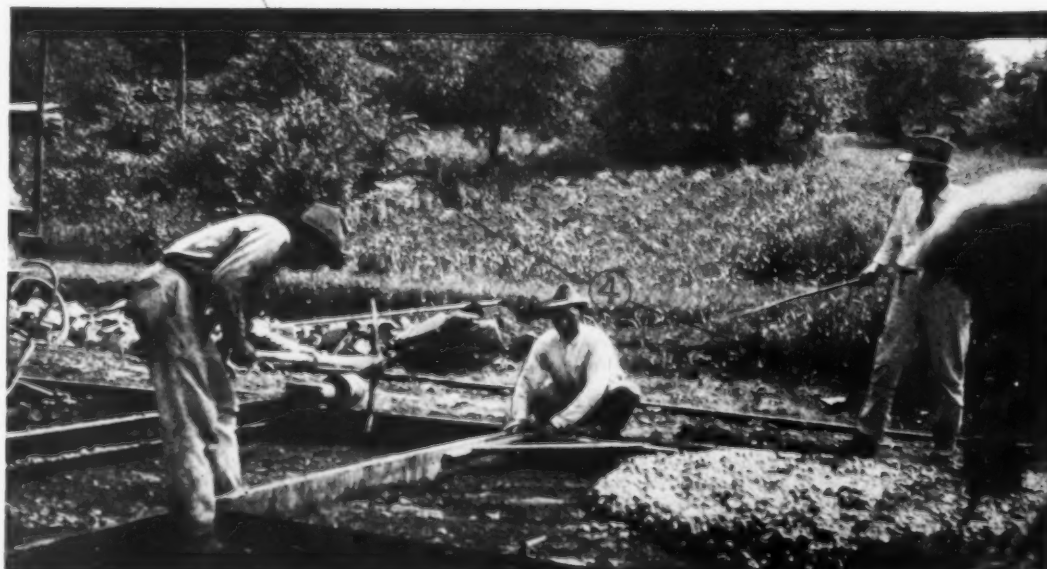


3. Pins are driven to hold the plank in place



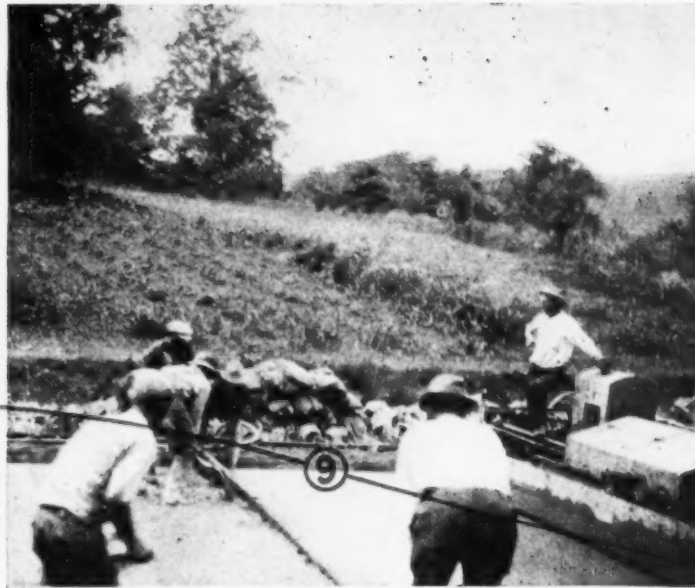
2. A plank dam is placed in position and checked with a large wooden square

4. Along the inside of the plank a trench $\frac{1}{2}$ in. deep is dug with a pick





8. Clips over the joint at the center of the pavement keep the two pieces in line



9. After the finishing machine has been over the concrete at least once, the plank dam is removed

7. The second piece of filler is then quickly placed



Follow
the
Red
Line

5. The trench cut by the pick is then carefully cleaned out. This trench drops the joint material below the bottom of the concrete

6. The pre-moulded joint filler is then set in place against the plank dam and concrete is thrown against it





10. As the plank is pulled out, several men fill the groove which it leaves

Follow the Red Line

12. Two strips of pine $\frac{3}{4} \times \frac{1}{2}$ in. by 9 ft. are then placed in the groove



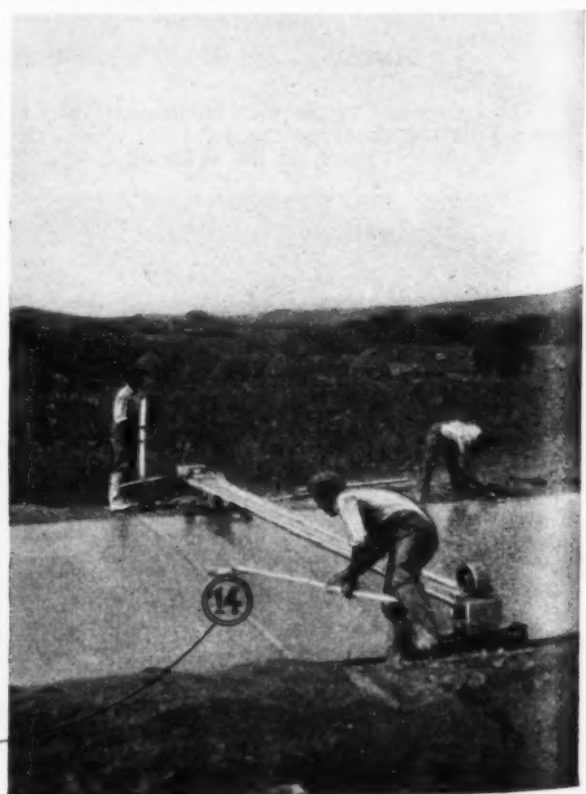
11. The finishing machine then works on the pavement. After about a half hour the material over the joint is removed with a plow-like instrument made of 1-in. board about 12 in. long and 8 in. high



13. The joint is then hand floated against these strips

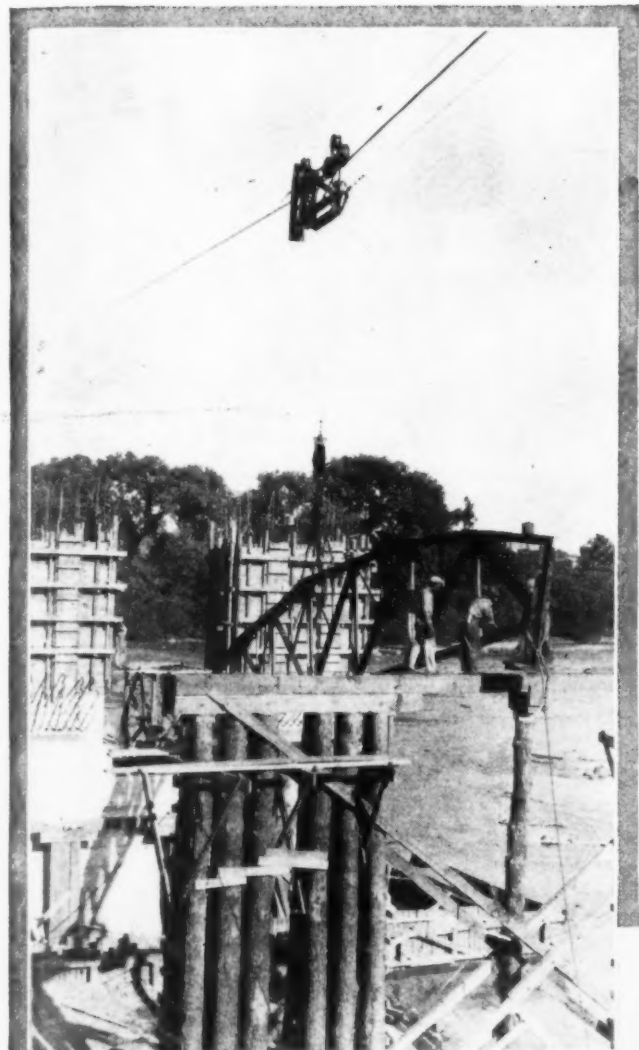


14. The joint is treated with a long handled float, after which the strips are removed and the edges of the joint lightly tooled



Crossing the Congaree

Old Wooden Bridge Replaced by Modern Concrete Structure— Cableway Handles Job

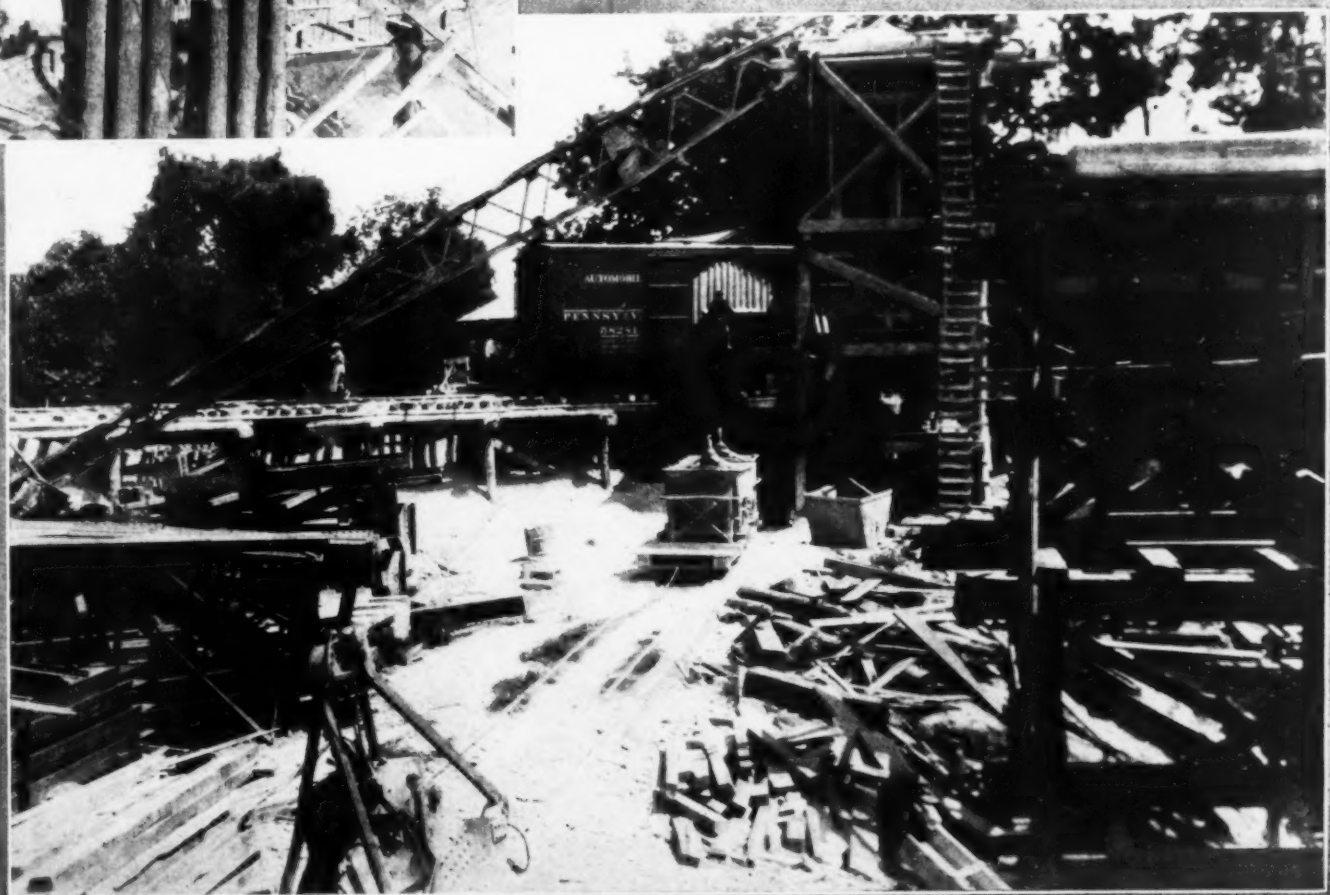


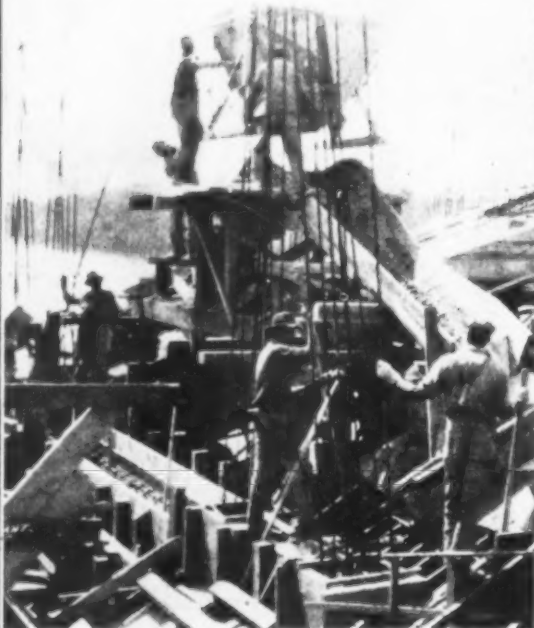
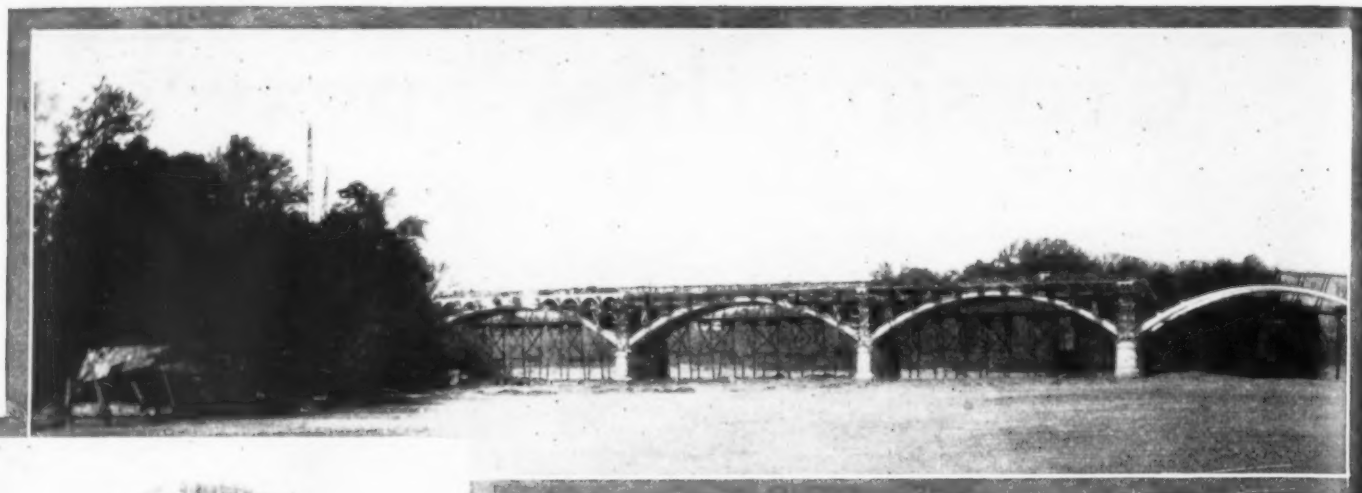
THE old Gervais Street Bridge across the Congaree River at Columbia, South Carolina, is being replaced with a handsome reinforced concrete structure. The new bridge has nine open spandrel arches on 138-ft. centers and two closed spandrel barrel arches on 27-ft. centers. Traffic will be diverted from the old bridge to the new next month when the Hardaway Contracting Co., Columbus, Ga., builder of the concrete structure, expects to have it ready for service.

Progress on the bridge has been uninterrupted since construction was started. An excellent concrete has been obtained, the surface being entirely free from honey-comb. All sand was inundated, and, as a result, the slump and strength of the concrete was under constant control. The Blaw-Knox inundator is praised by J. J. Taylor, superintendent, for its performance in producing uniformly good concrete.

At left—Setting steel centering for one of the arches in mid-stream

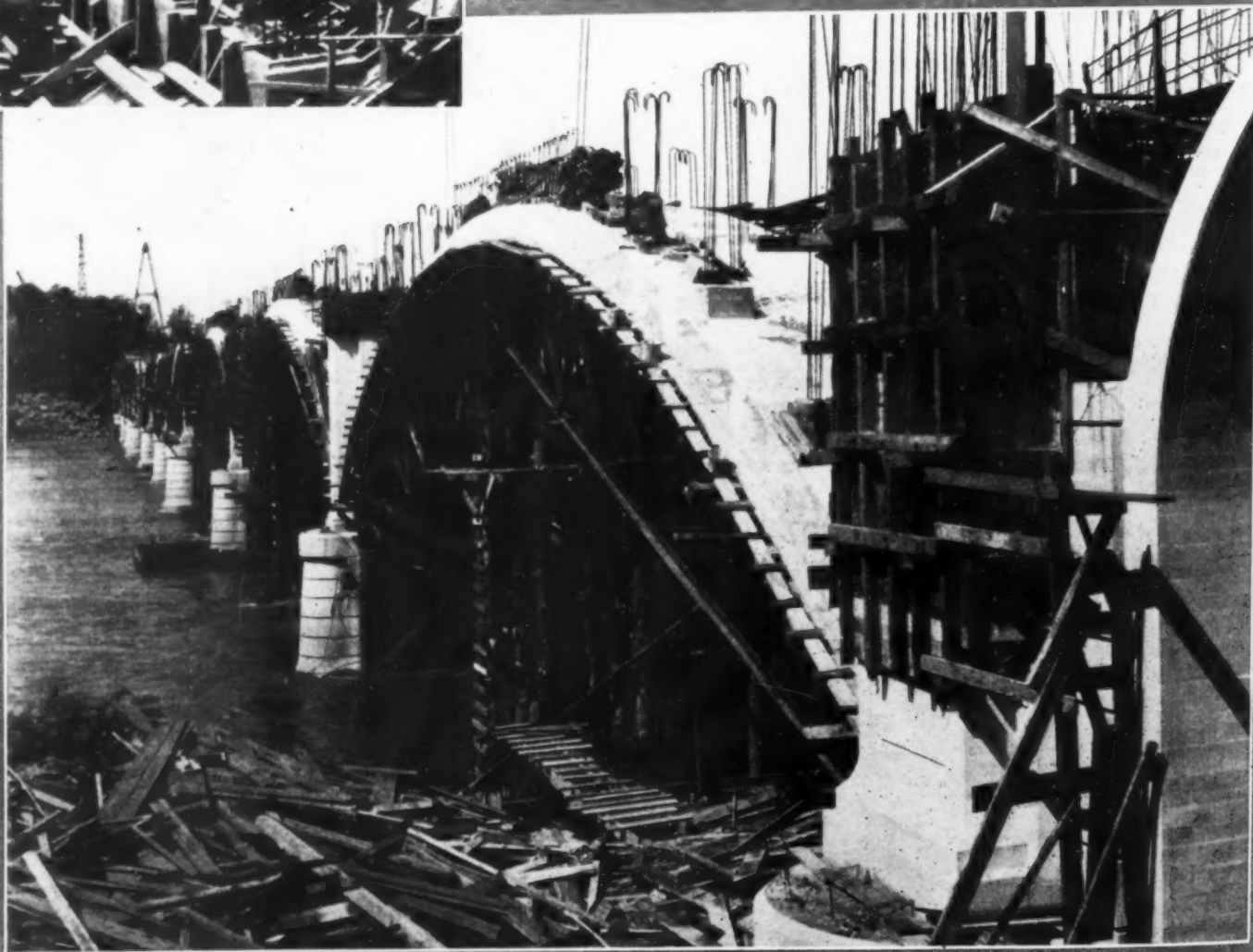
Below—The mixing plant. Concrete hauled to cableway in buckets on narrow-gage cars





Pouring concrete for one of the arches from bucket brought by cableway. Arrangement of centering supported by falsework is shown below

The principal feature of the job equipment is a high-line cableway across the river. The towers are 113 ft. high, and the distance between them is 1,535 ft. The 2½-in. main cable is anchored in concrete blocks 4 x 5 ft. by 24 ft. long, reinforced with 1½-in. rods and 60-lb. rails. The capacity of the cableway is 10 tons, and its speed about 20 miles an hour. A 60-hp. 2-drum steam Lidgerwood hoisting engine supplies the power. The single cableway has worked satisfactorily, but there is some question if two would not have been better, as the bridge has a

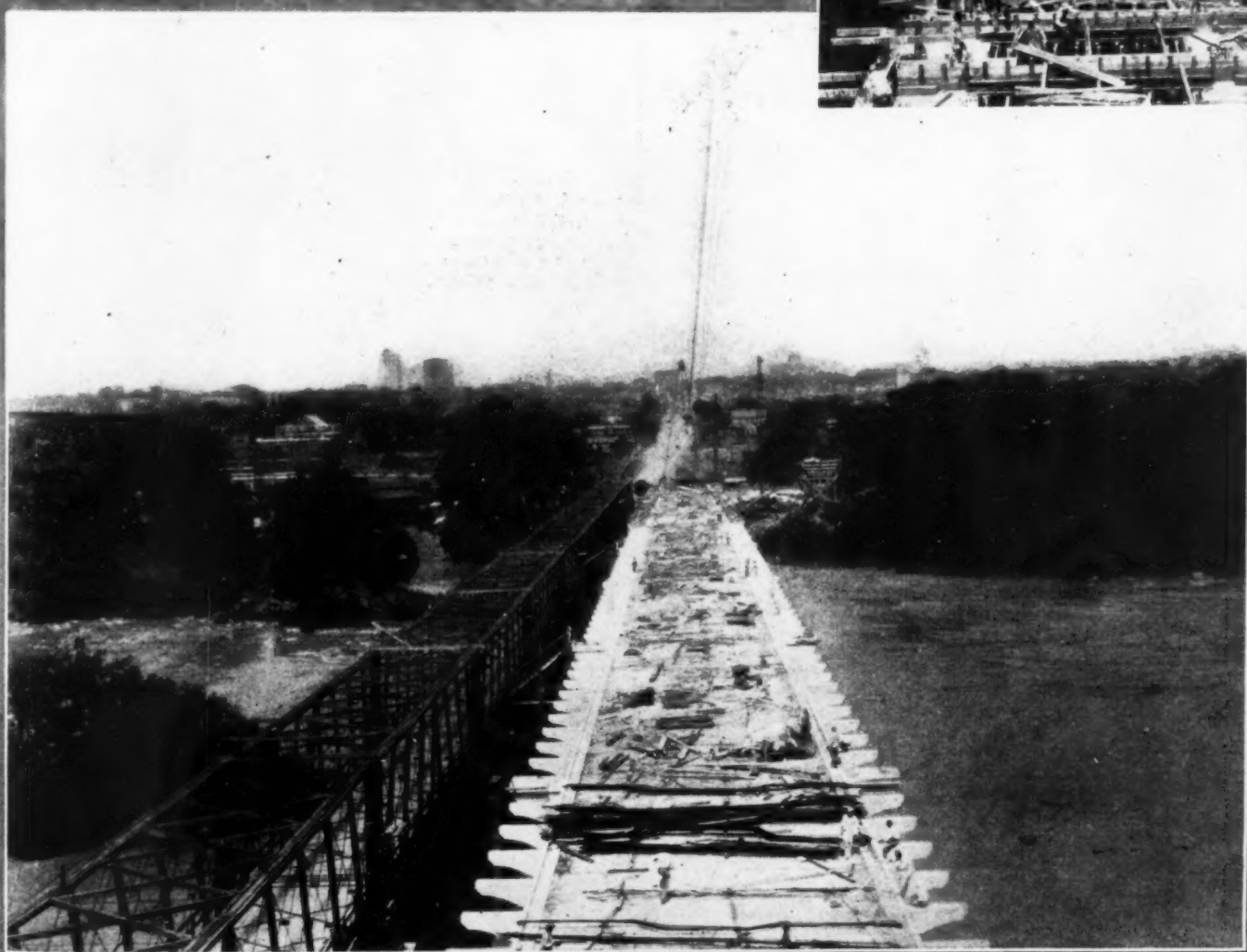
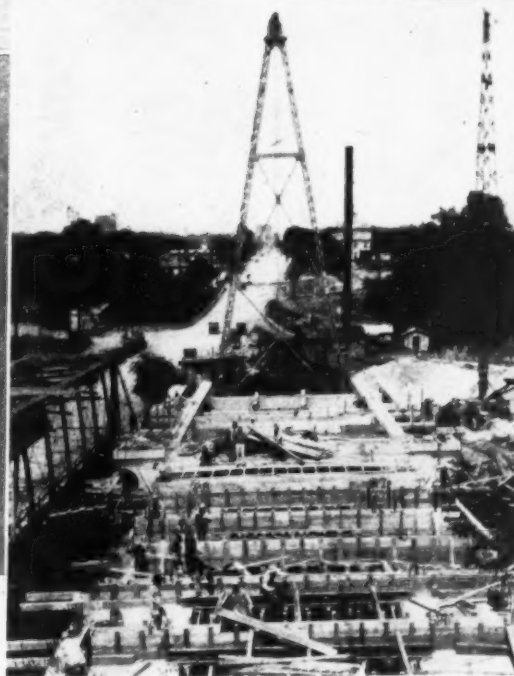




roadway width of 36 ft. and two 6-ft. sidewalks, making a total width difficult to cover with one high-line.

Suitable foundations for the piers were found at river bed in solid rock. Cofferdam timbers were framed on shore and placed with the cableway. There were two frames for each coffer. The inside frame allowed 3 ft. of clearance around the forms. It was built in one piece. The outside frame was placed in four sections, leaving space for a 5-ft. clay chamber between the frames. A 20-hp. boiler was

Steel I-beams are used for supporting the forms. Cableway tower in background. The old bridge is at the left in the lower photograph



installed on the clay chamber to supply steam for drilling. Piers are set into the rock about 4 ft.

Arches were poured in units of three. This division made two river abutment piers necessary. The abutment piers are 60 ft. by 16 ft. 6 in. All other piers are 56 ft. by 13 ft. All piers are hollow and are backfilled with rock.

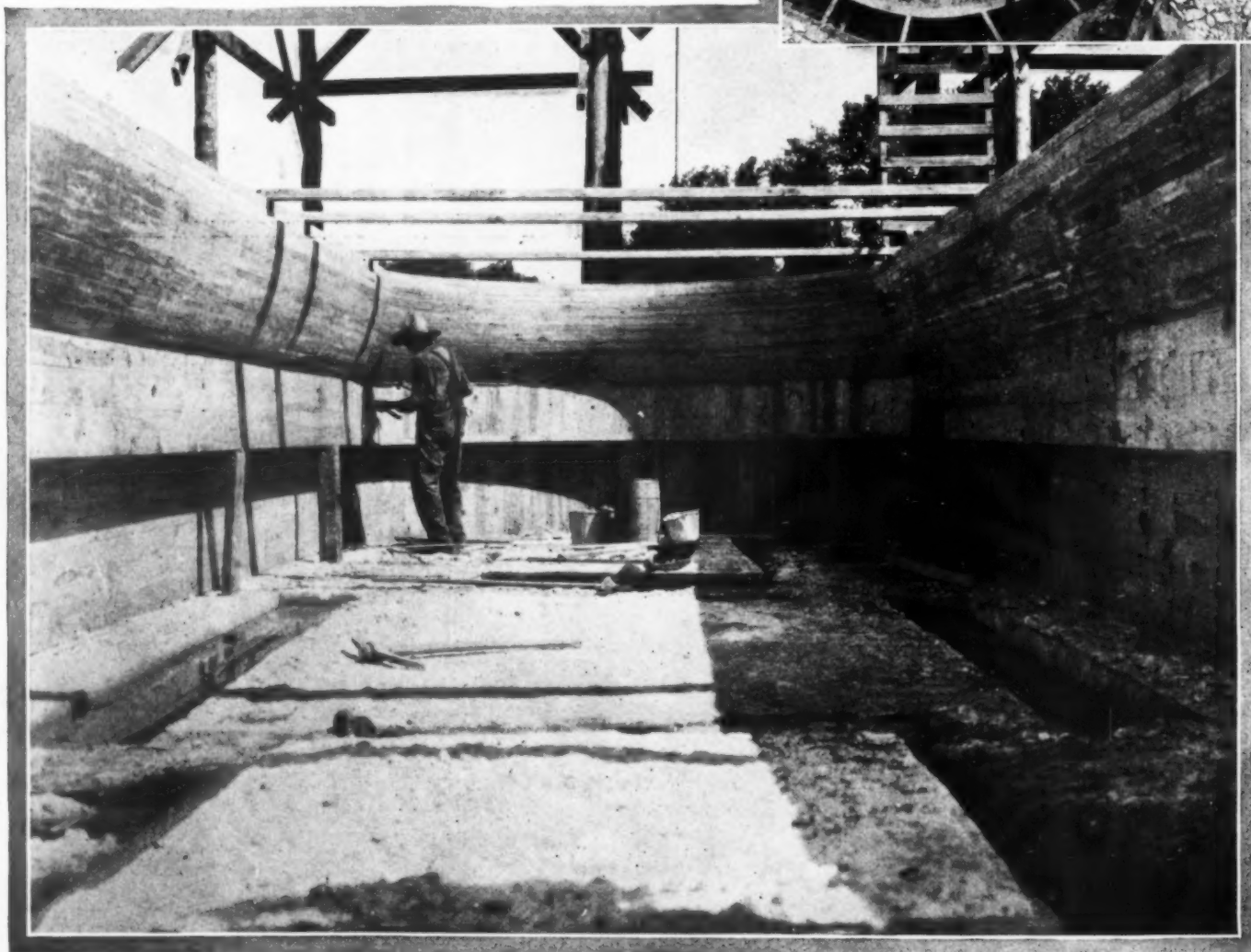
Centering was supported on falsework bents at the center of the arches. In pouring the middle trio of arches, all concrete on two of the arches was placed before any part of the third was poured. This unusual procedure did not cause deflection of the pier receiving the unbalanced thrust.

The job has its own spur track which is brought down Gervais Street about one-half mile from a main line railroad. Cement cars may be unloaded out of one door into the cement house or out the other on to the mixer platform. Concrete buckets are loaded at the mixer and are run under the cableway on narrow-gage cars operated by a hoist engine.

The job has been under dual direction most of the time, R. E. Hardaway and J. J. Taylor co-operating as superintendents under the general supervision of T. A. Jamison, vice-president of the Hardaway Contracting Company. Mr. Hardaway was placed in charge of another job, however, and Mr. Taylor has had complete responsibility for several months. The bridge is being built for the South Carolina State Highway Department, of which J. W. Barnwell is bridge engineer. The resident engineer is Cecil Johnson.

Below—Putting the finishing touches on interior of pier form in river

At right—Pouring concrete for footing of one of the piers



Driving Sheeting Where Space Is Scarce

IN CONSTRUCTING a sewer for the city of White Plains the Spedarrow Construction Company was obliged to carry the trench along Main Street where that street passes under the tracks of the Harlem Division of the New York Central Railroad. This fact made it necessary to work in close quarters while driving the sheeting. The job was handled by running a Northwest crane as close as possible to the railroad bridge with its boom extended under the

bridge. A McKiernan-Terry hammer operated by air from an Ingersoll-Rand compressor was then suspended from the end of the boom. With this outfit the sheeting was driven in a place where it would have been extremely difficult to use other equipment. Even with this arrangement there was very little space in which to work. Construction of the sewer is under the supervision of Frederick C. Brandes, city engineer of the New York municipality.

Looking under the railroad bridge. The crane may be seen on the other side with its boom extended under the tracks



Looking out from under the bridge. The boom of the crane may be seen at the top

CASH PRIZES for PHOTOGRAPHS

First \$25 Second \$15 Third \$10

See Conditions on Page 16

Bypass Will Relieve Congestion

Wherever needed, substantial curbs are being built on the new bypass. The long fill may be seen in the distance

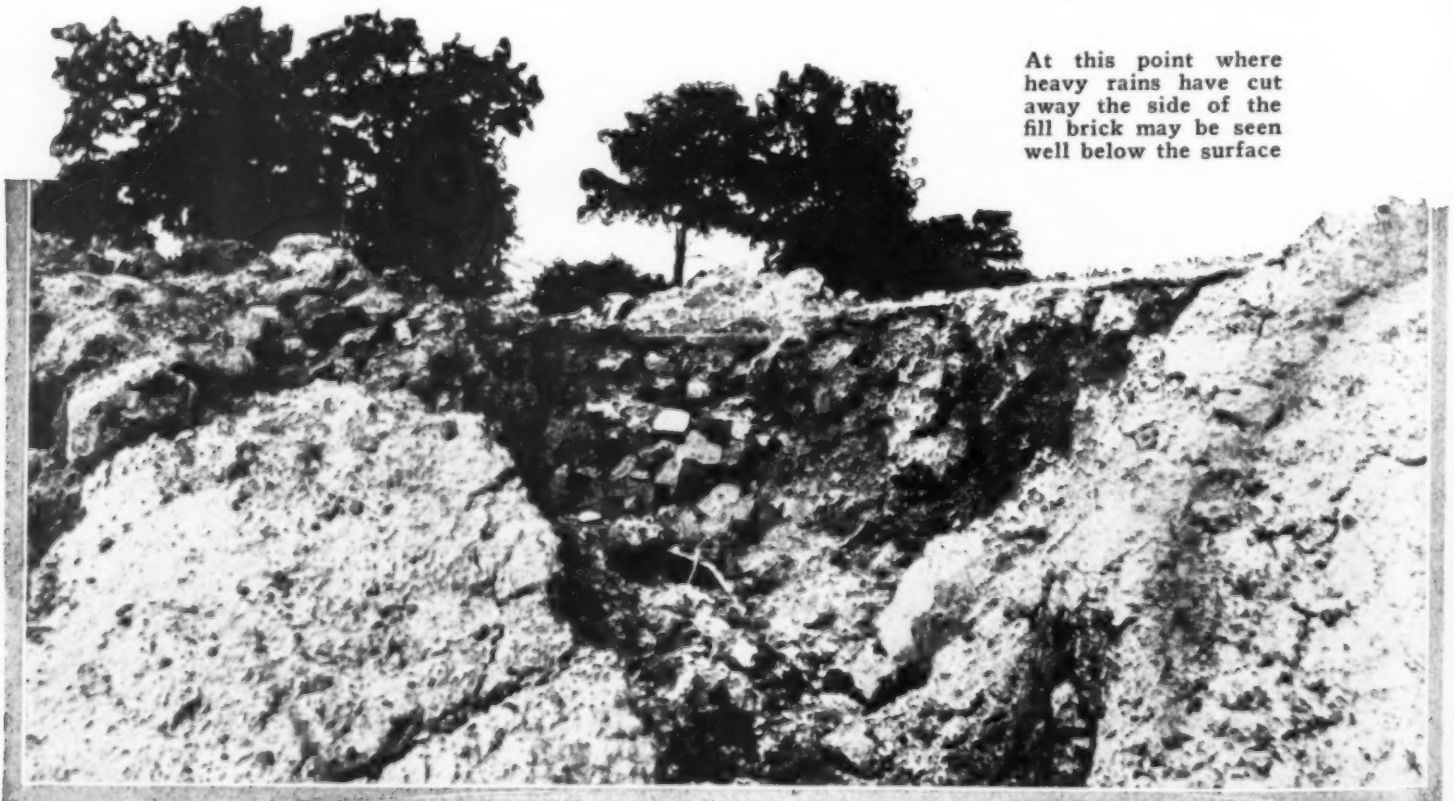


SITUATED between the great metropolitan centers, New York and Philadelphia, the State of New Jersey has had to take care of an extremely large flow of traffic, and the Highway Commission has a big job on its hands. One of the main routes on which traffic is greatest is that leading from New York to the shore resorts on the Jersey coast,

and this route is continually being improved in every way.

A typical example of the work now under way is the construction of about three miles of road to bypass Keyport, always a congested point. One section of this bypass was finished last year, and the other section, about 1½ miles in length, is now being built by Decker & Canning of

At this point where heavy rains have cut away the side of the fill brick may be seen well below the surface



on Shore Highway in New Jersey

Great quantities of black mud were forced up by the settling of the fill



Newark, N. J. It will consist of a concrete road 29 to 40 ft. in width. The pavement will be 9 in. thick and contain double reinforcing. This part of the work is being handled with a Rex paver.

One of the most interesting parts of the job was the building of a fill 3,000 ft. in length, across the meadows formed by a small tidal stream. This fill required an unusual amount of material, about 185,000 yd. being used. Work was begun in November of last year and continued through the winter. A. C. Canning, superintendent for the contractors, made his job a little easier by buying up the waste material of an old brickyard in the neighborhood. He dumped about 20,000 yd. of brick into the fill which greatly improved the going for the trucks, especially during the wet spring months. He dumped the brick on the fill and used a Cletrac tractor to spread them out into a rough sort of road.

The work is being done under the direction of T. E.

Olsen, district engineer. H. A. Hartmann is directly in charge of the job for the highway commission.

The long fill across the meadows. A draw span will be erected over the small stream which at present separates the two sections of the fill



A Contractor's

Offices of John Gill & Sons Cleveland Ohio

At right—The corridor suggests to the visitor the character of the organization



Above — Pictures of buildings constructed by John Gill & Sons line the walls of this corridor

ESTABLISHED by John Gill in 1854, the contracting organization of John Gill & Sons has a record of 73 years of service in the construction field. The business is carried on by Kermode F. Gill and John T. Gill, sons of John Gill who died in 1912. The offices are in Cleveland.

The work of John Gill & Sons has not been confined to Cleveland. Among the notable buildings constructed are: Missouri State Capitol, Jefferson City; Ben Franklin Hotel, Philadelphia; Hudson County Court House, Jersey City, N. J.; Washington postoffice, Washington, D. C.; City Court House, Baltimore, Md.; Liberty Bank, Buffalo, N. Y., and the Naval Training Station, Norfolk, Va. At present they are building the new Cleveland Union Station.



At right—The drafting room is light and spacious

Headquarters



Above—The private office of Kermode F. Gill

At right—Plans of the current jobs are accessible in this room

Below—The big conference room is the largest of the office suite



Mobile Crane Sets Steel

Boom Extension Increases Range of Machine

IN SETTING the steel for a three-story apartment building in Pittsburgh, the contractors saved considerable time and money by planning the job in such a way that they were able to make use of a Universal crane mounted on a Mack truck. The crane was equipped with a 52-ft. boom consisting of an 8-ft. extension at the base of the standard 28-ft. boom and a 16-ft. extension at the head. Not only was all the steel set by the crane, but a little clever planning made it possible to operate from only two set-ups. The photograph at the bottom of the opposite page shows the crane at work at one of the set-ups. The other was about 20-ft. further toward the front at the same side of the building.

Altogether about 170 tons of steel were set. One of the



Handling a heavy girder in early stages of the work

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ne

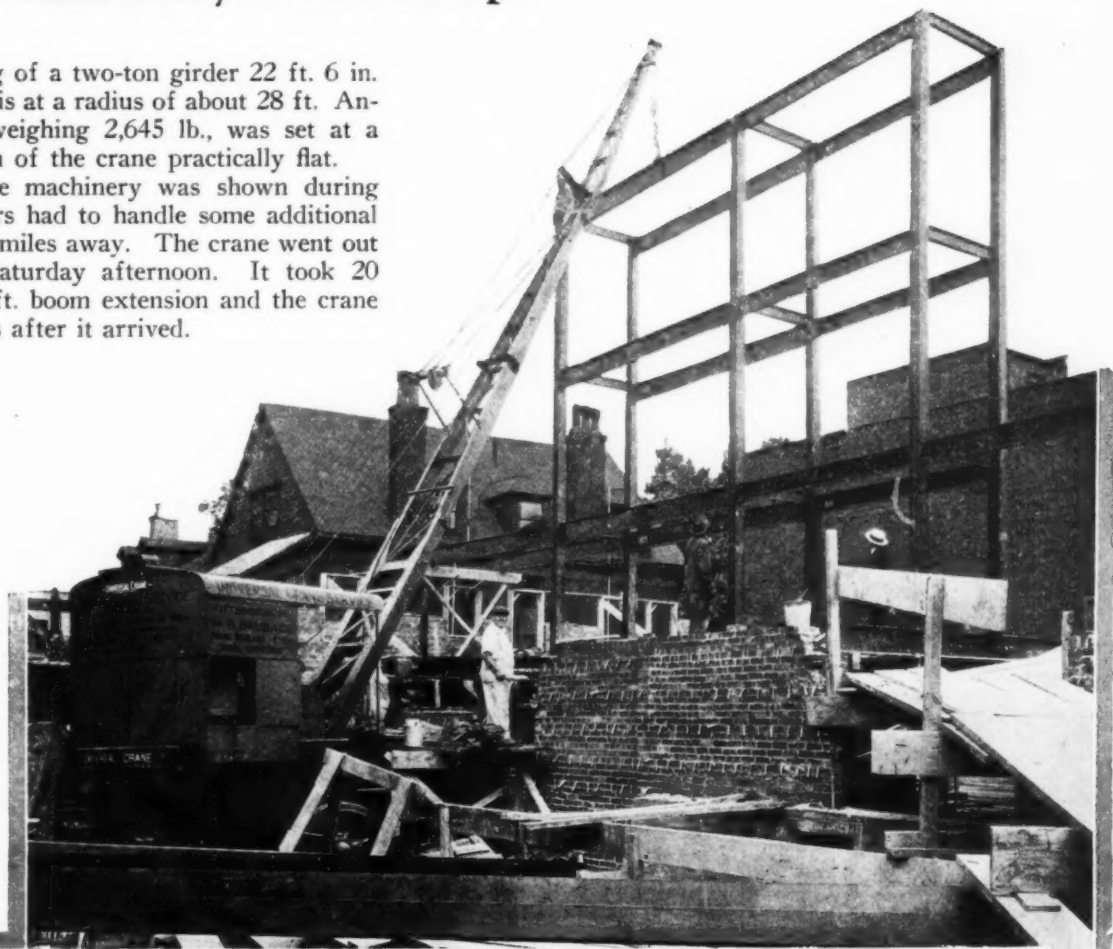
on Three-Story Building

Which Operates From Only Two Set-Ups

hardest jobs was the setting of a two-ton girder 22 ft. 6 in. long. The crane handled this at a radius of about 28 ft. Another girder 23 ft. long, weighing 2,645 lb., was set at a 50 ft. radius with the boom of the crane practically flat.

The advantage of mobile machinery was shown during the job when the contractors had to handle some additional work on a building about 4 miles away. The crane went out to the second job on a Saturday afternoon. It took 20 minutes to take off the 16-ft. boom extension and the crane was in operation 20 minutes after it arrived.

The crane operated from only two set-ups in erecting all of the 170 tons of steel in the three-story structure



Highway Contractors Tackle

Careful Planning Makes Unfamiliar

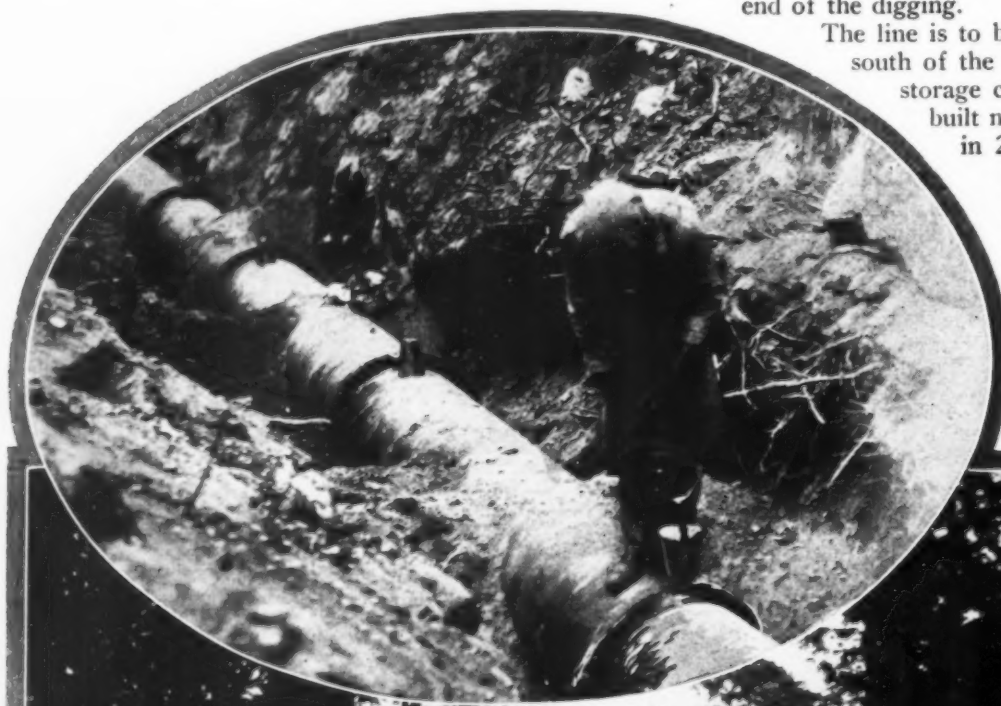
CAN a contracting organization equipped for one kind of construction work compete successfully in another field when business slackens in its own special province? The question seems to have been answered in the affirmative by Robert G. Lassiter & Company, Raleigh, N. C., who are well known as road builders, but who only recently have attempted to obtain a place among pipe line contractors. They may never repeat the attempt. If they do not, the reason will be the abundance of highway work and not failure in their first effort.

By some thoughtful planning of how to adapt their equipment to the job of laying 7 miles of cast-iron pipe for the

city of Raleigh, the Lassiter organization was able to enter the lowest bid and obtain the contract. Records of the work indicate there was no error of judgment in preparing the bid.

The trench has been dug by a Link-Belt dragline equipped with a 1-cu.yd. Page bucket. A crawler Erie steam shovel moves along the side of the trench and lowers the pipe into place quickly and easily. The material excavated has been mostly clay, although sandstone was encountered toward the end of the digging.

The line is to bring raw water from a point 7 miles south of the city's pumping plant. A dam with a storage capacity of one billion gallons will be built next year to feed the line. The pipe is in 20 and 24-in. sizes. It has been unloaded at two points. The simple derrick and engine shown in one of



Pouring Leadite joints on 7-mile pipe line

Steam shovel lowering pipe into trench



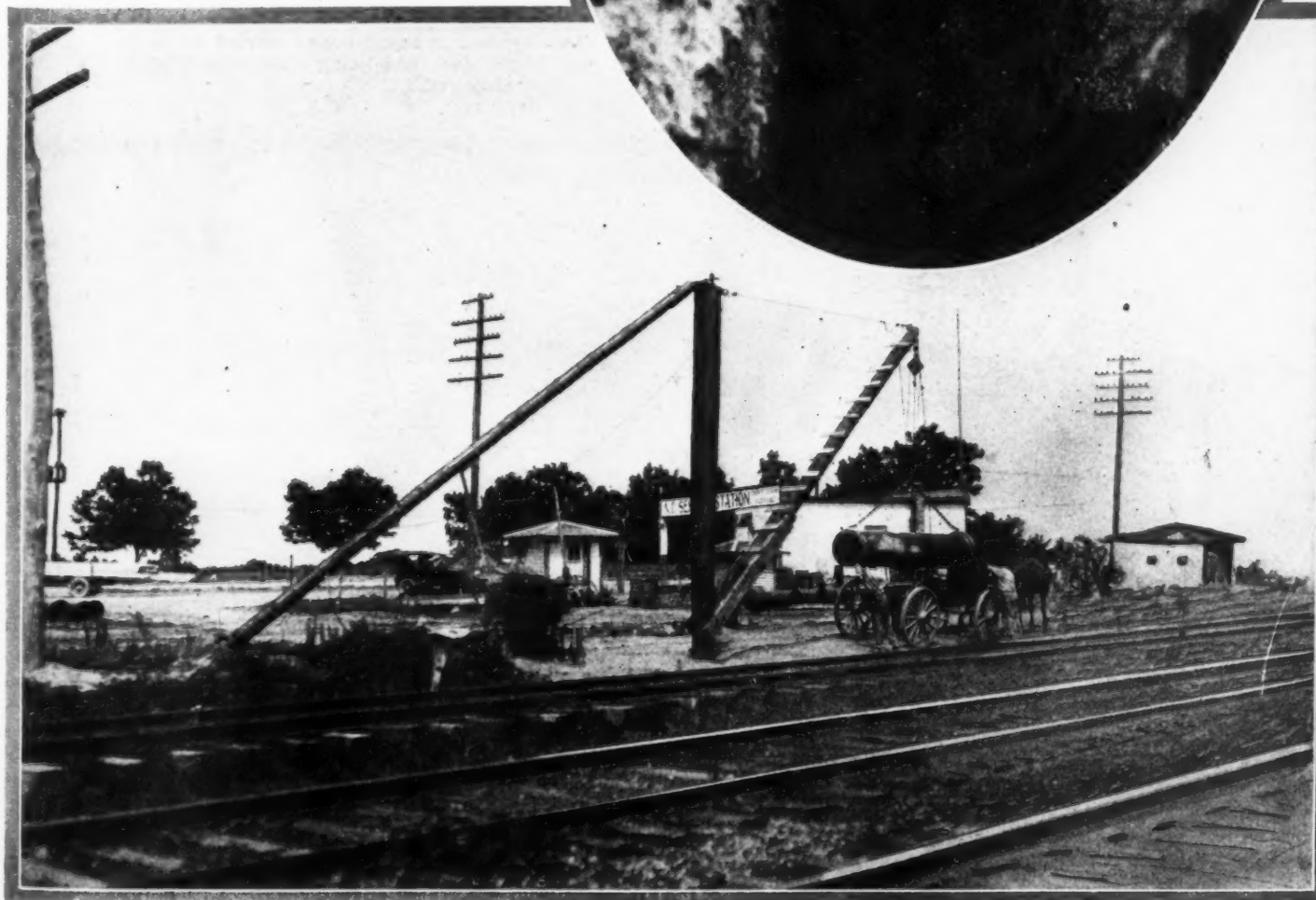
e Pipe Line Job

Success of Work in Province

the photographs was used at both unloading points. A small hoist was connected to the drive shaft of an old automobile engine by a universal joint. This combination handled all the pipe very effectively by running the motor in low gear. Up to the time that the rock was encountered, an average of 575 ft. a day, including rainy days and holidays, had been made. On one day, 1,200 ft. of pipe was laid. The line is being constructed under the supervision of William C. Olsen, Inc., Raleigh, N. C., consulting engineers for the project. C. W. Mengel, vice-president of the Olsen corporation, is directly in charge. F. D. Cline, general superintendent for Lassiter & Company, has charge of operations. C. W. Harlow is superintendent of the job.

An old automobile engine operated this home-made derrick

This dragline excavated all of the trench



More Concrete

Highway Improvement Program



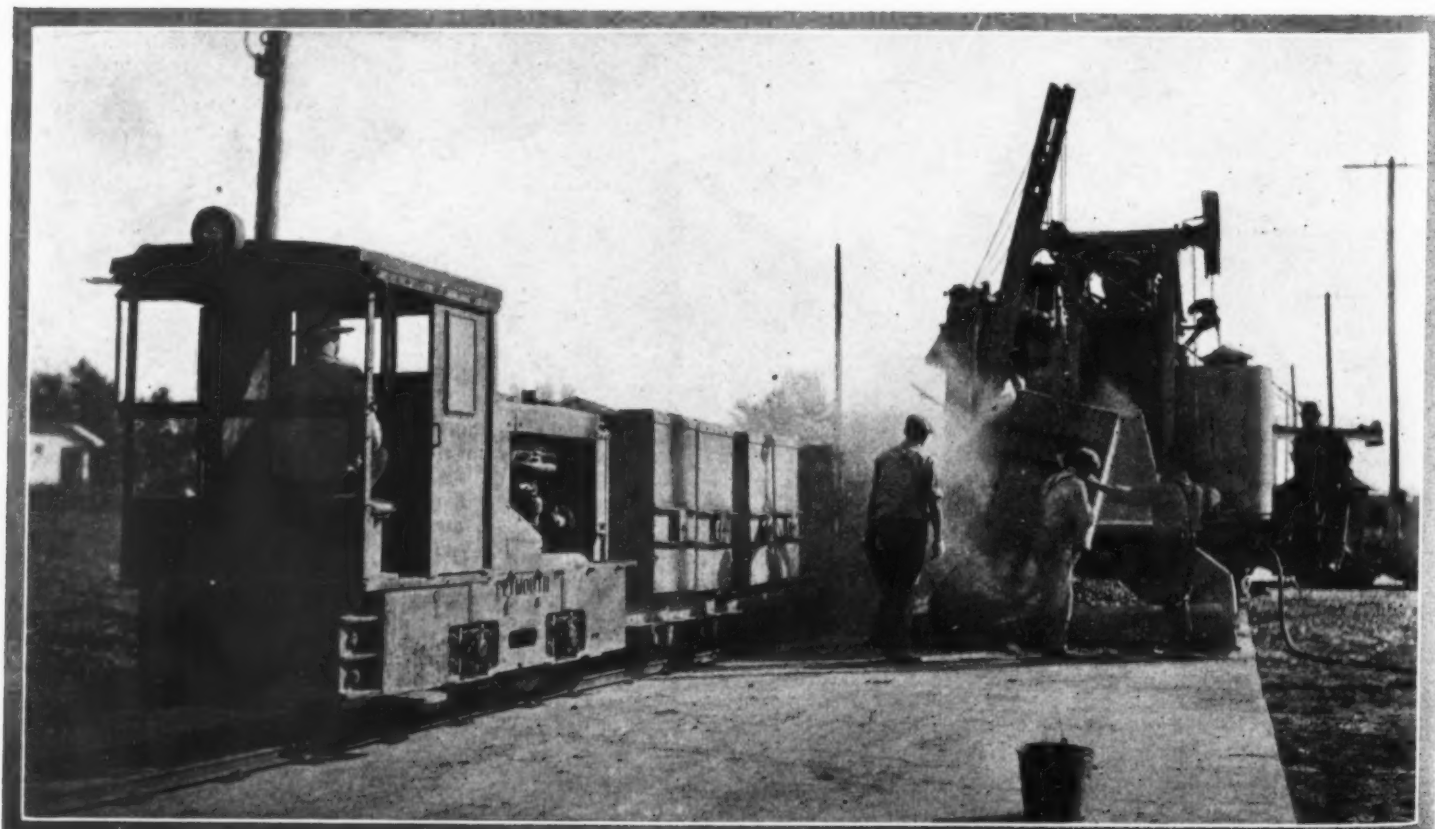
Ed Byers
the mixer
foreman

WAYNE County, Mich., in which Detroit is situated, and which was a pioneer in the construction of concrete roads, is keeping up its reputation for up-to-date highways. Many of the old roads are being widened, curves are being eliminated, and, in addition, considerable new construction is always going on. Concrete pavement is still a favorite with the Board of Wayne County Road Commissioners. Industrial haulage is used to carry materials to the mixer.



Above—Some of the industrial trains between material yard and mixer consisted of as many as 15 cars. A Plymouth locomotive is hauling this one

Below—Aggregates arriving at the mixer in batch boxes carried by Koppel cars and being dumped into skip of paver.



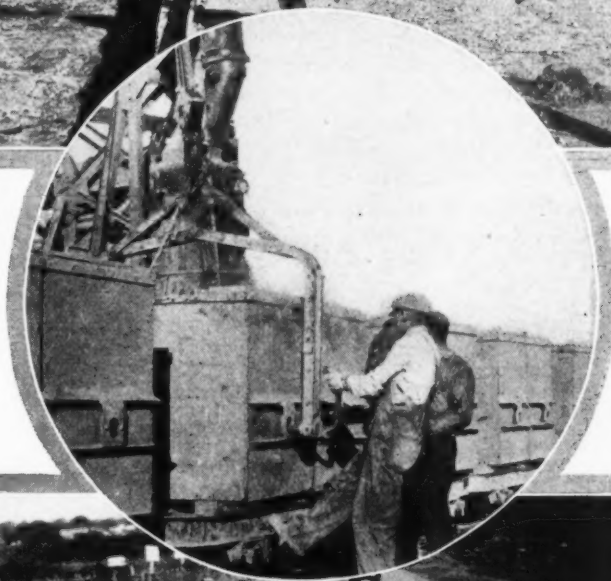
for Wayne County

Includes Widening of Old Pavements



Above — Subgrade prepared for adding 10-ft. strip to old pavement

At right — Lifting batch boxes from car



Below — Finishing 10-ft. strip added to side of road

ROAD UNDER
CONSTRUCTION
TRAVEL AT YOUR
OWN RISK
BOARD OF WAYNE COUNTY
ROAD COMMISSIONERS



Steel Warehouses for St

Eight Big Buildings Under One Ship Channel Will Provide Contractors

THE new warehouse plant of the Carnegie Steel Company at Houston, Texas, is of interest to construction men for three reasons. The methods employed in building it, although not unusual, are good; the arrangement of facilities is such as to gain maximum efficiency in operation, and the location of the plant makes steel products more readily available to contractors in the Southwest area served.

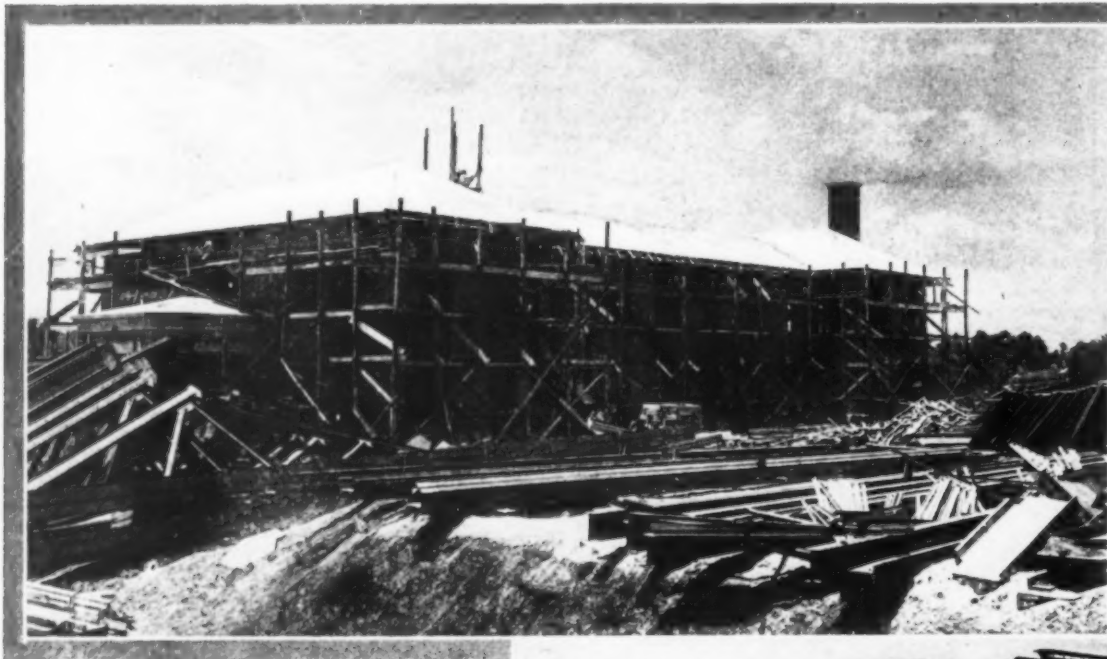
The eight warehouse buildings are all under one roof. Seven of them are 80 ft. wide and 480 ft. long. The eighth is 85 ft. by 480 ft. They are of heavy steel frame construction covered with galvanized sheeting. Locomotive cranes were used in erecting the steel, as the front cover photograph shows. It had just begun setting the roof trusses on the last of the eight warehouses. The picture at the bottom of these two pages was taken the same day and shows seven of the warehouses enclosed, with the crane still setting steel on the eighth building. The office building which appears in one of the pictures is of brick, concrete, and steel. Tiles have been laid over the concrete roof since the photograph was taken.

The upper right-hand picture on the opposite page shows a No. 1 Vulcan steam hammer driving 65-ft. creosoted timber

piles for the 300-ft. dock along the ship channel frontage of the plant. The location of the slip for barges is shown in the center photograph which was taken after the concrete piers which form column footings had been cast. Each of these piers rests on a timber pile foundation. The slip has since been excavated to a depth of 10 ft. below water level.

The roof and the crane runways from the buildings at the right in the picture extend over the barge slip. Two railroad tracks are laid between the slip and the storage floor of the buildings. A roadway passes through the opposite end of the structures. Mill shipments may be unloaded by crane from barges directly into cars or trucks, or they may be stored on the warehouse floor. One of the railroad tracks runs on to the dock for ocean going ships. High speed electric cranes in all buildings allow quick handling of the heavy materials.

Texas contractors welcome the new plant because it assures prompt filling of their steel orders. Rolled shapes, wire products, and black and galvanized sheets will always be available for quick delivery. The warehouse is built on a 100-acre site advantageously located for its purpose and



At left — The office building is built of brick with concrete and tile roof

At right—A general view of the row of big warehouses with the last of the line still under construction

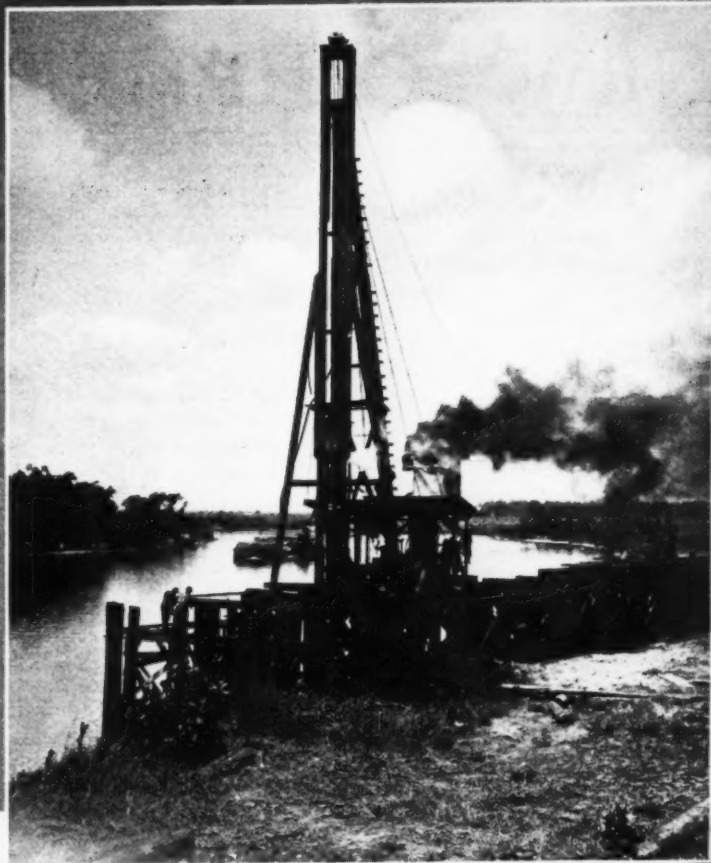


or Steel Storage

Roof at Tidewater on Houston Better Service for in Southwest

adjoining the big docks of the Southern Pacific railroad. Auxiliary buildings will house the general offices of the plant, an electric substation which will distribute power to drive the machinery, a large store room, locker rooms and showers and an emergency hospital. The plant is equipped to function as a complete unit. Within the buildings and on adjoining grounds considerable standard-gage rail has been laid connecting with the Clinton branch of the Southern Pacific.

The plant will be a most complete and modern warehouse for the storage, fabrication and distribution of steel products throughout the Texas territory, while through shipments from the mills reaching Houston by water from Atlantic, Gulf and Mississippi River ports will be transferred here for reconsignment by rail.



Excavation for the barge slip is shown at the right. This slip will make it possible to bring the steel laden barges into the warehouses which will be extended over the slip

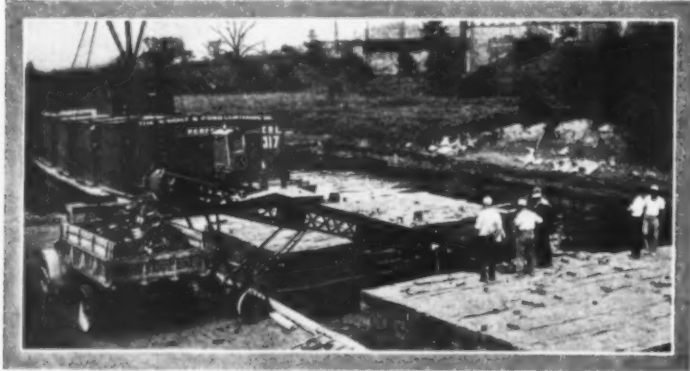


The piledriver at the top of the page is building the dock which will extend 300 ft. along the bank of the Houston ship channel

NEW EQUIPMENT ON THE JOB

For Unloading Brick

A brick unloader consisting of a conveyor 40 ft. long mounted on swivel wheels which rest on the dock, the other end operating on a 2-wheel truck with a fifth wheel



arrangement and pole extension, has been put on the market by the George Haiss Manufacturing Company of New York City. This machine is equipped with a wire belt 20 in. wide running on ball bearing rollers.

A Two-Ton Tier Lift Truck

A lighter duty electric tiering truck is being manufactured by the Elwell-Parker Electric Company of Cleveland, Ohio. This machine will handle skid loads as in ordinary power-lift



truck service, and it also can elevate the load from the floor 4 to 8 ft. when tiering or stacking in storage and stock rooms or delivering goods to motor trucks or railroad cars. The new motor is known as the 2-ton tiering truck, the previous

sizes being rated at 3 and 6 tons. The machine can be equipped with platforms of different sizes to suit the materials handled. It is especially designed for the lighter manufacturing branches of industry as well as warehouses, railroad stores, shops and steamship terminal work.

Special Jack for Finisher

A new jack which is designed for mounting the transportation wheels on finishing machines is being sold by the Lakewood Engineering Company of Cleveland, which also manu-



factures screeds and tampers. This jack makes it easy for the contractor to remove or install the transportation wheels on the job, an operation which previously took considerable time and trouble. The photograph shows the jack in operation and gives a good idea of how it raises and lowers the finisher.

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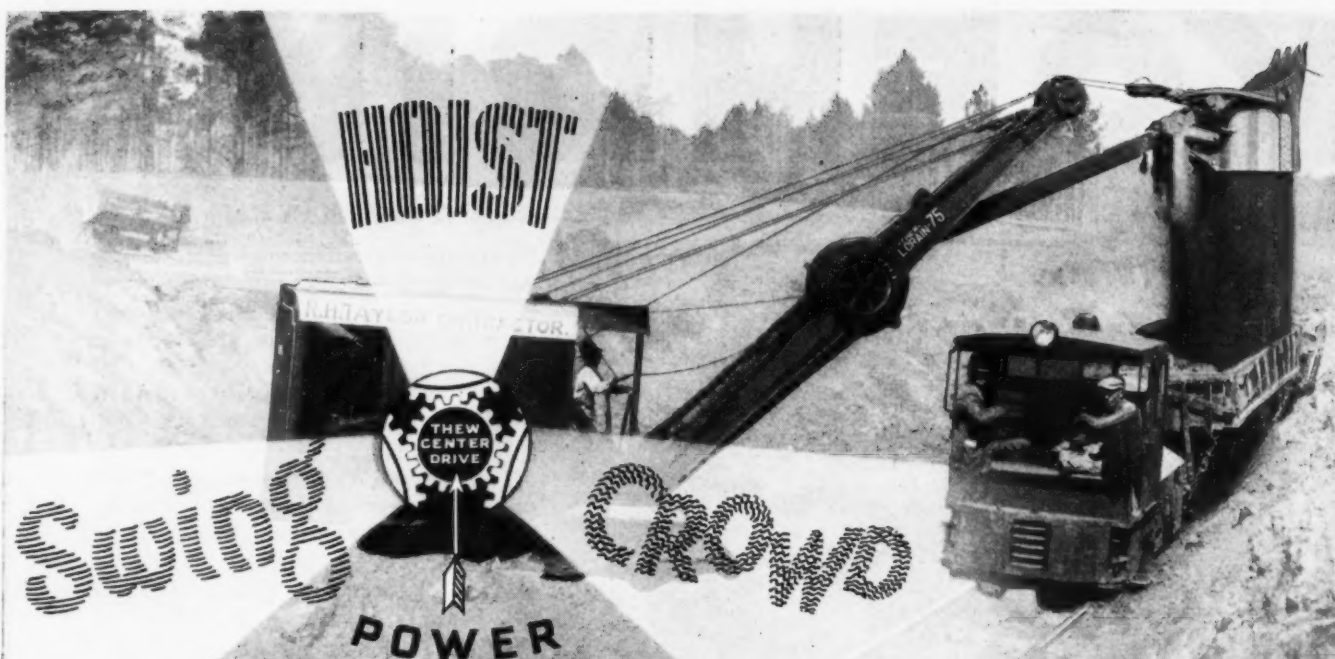
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WHEN quality of concrete is under rigid inspection — — when vigilant inspectors or engineers set batch meters and mixing period according to uniformity and quality of concrete — — then you'll find that Koehring Re-mixing Action means a lot to speed in getting concrete on to the subgrade! You'll find it is a big factor in getting more batches per day, more yardage on the subgrade!

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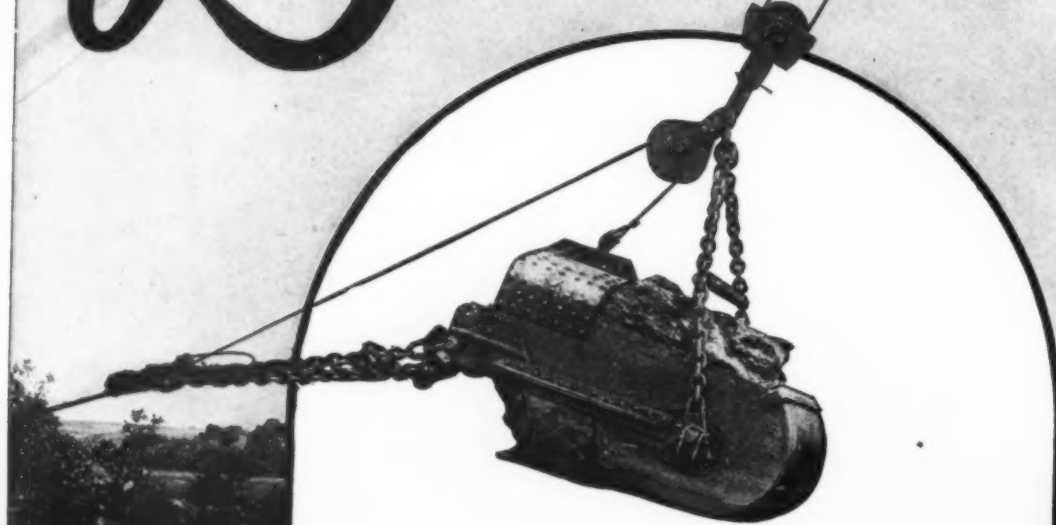
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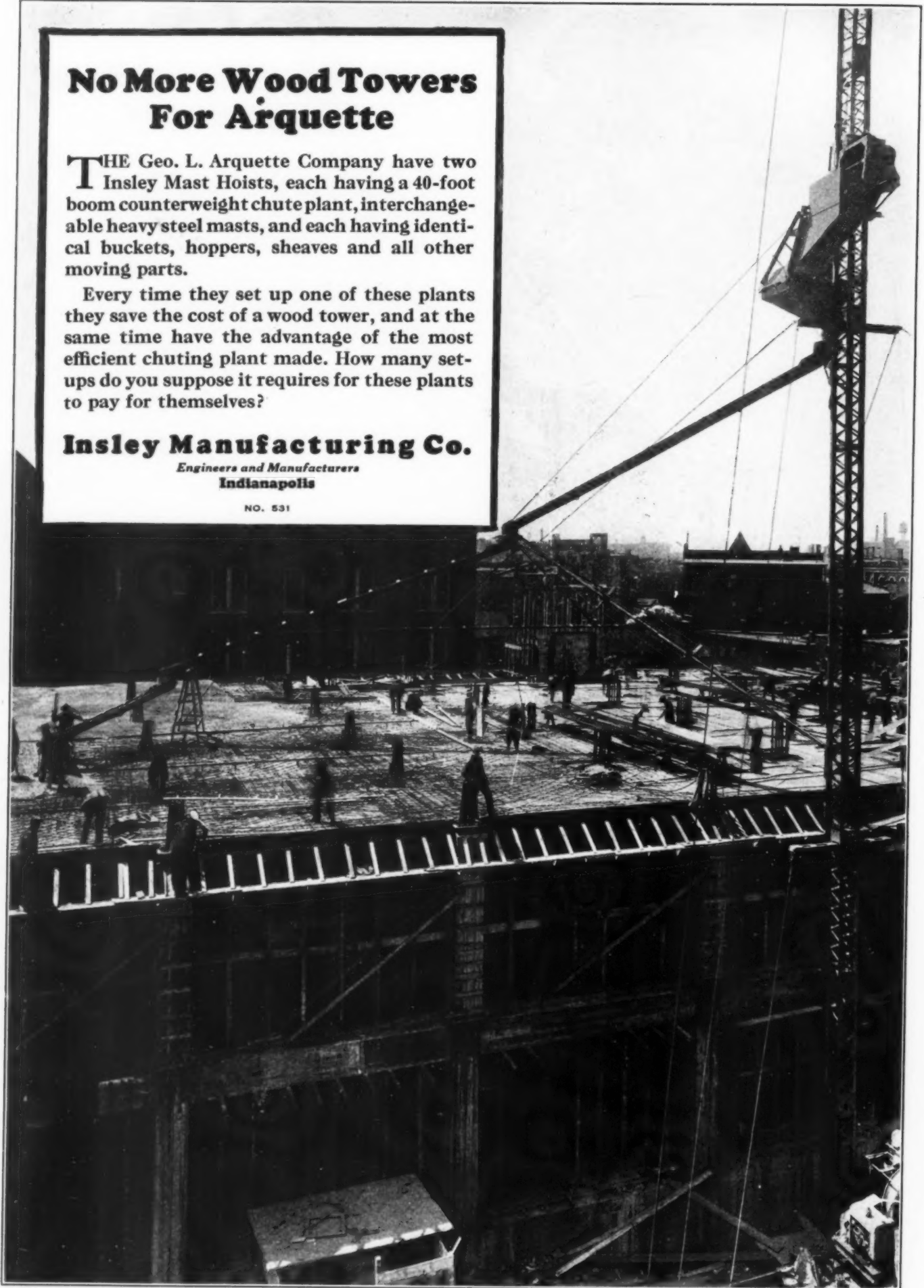
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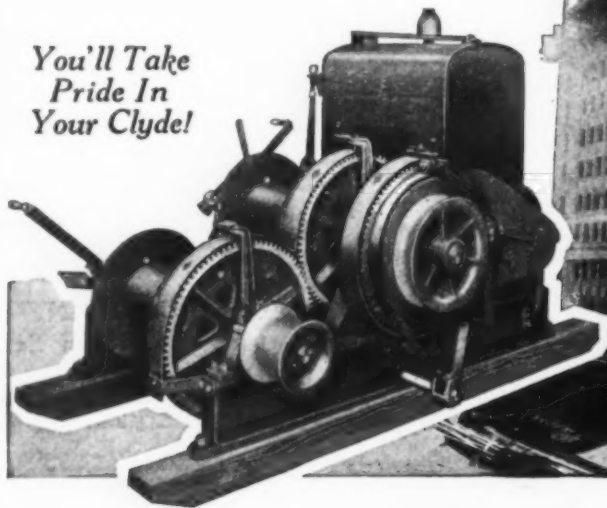


HOISTS CLYDE DERRICKS

The illustration shows the new Thomas Jefferson hotel under construction at Birmingham, Ala. Foster & Creighton Co. of Nashville, Tenn., were the general contractors. Two Clyde double drum gasoline hoists were used on the job to handle all materials.

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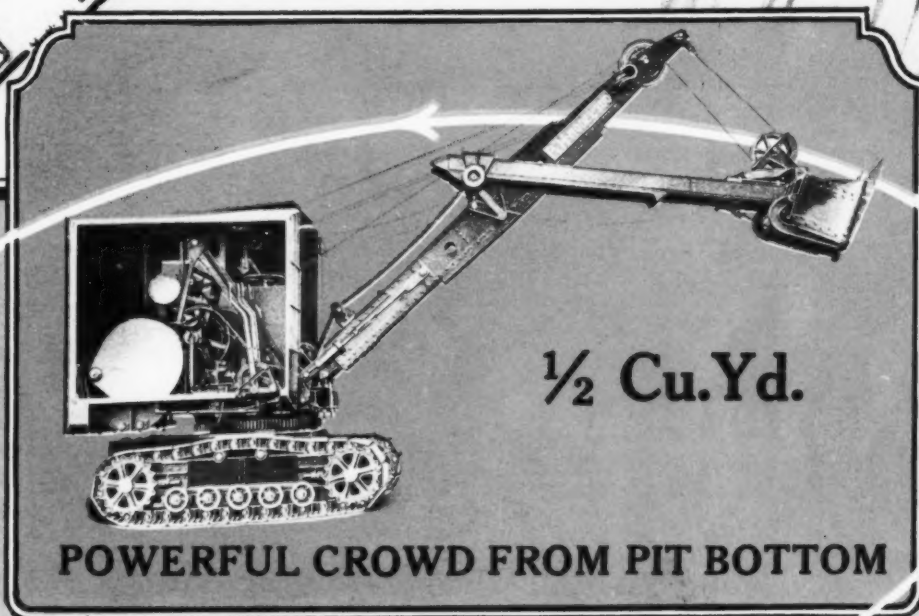
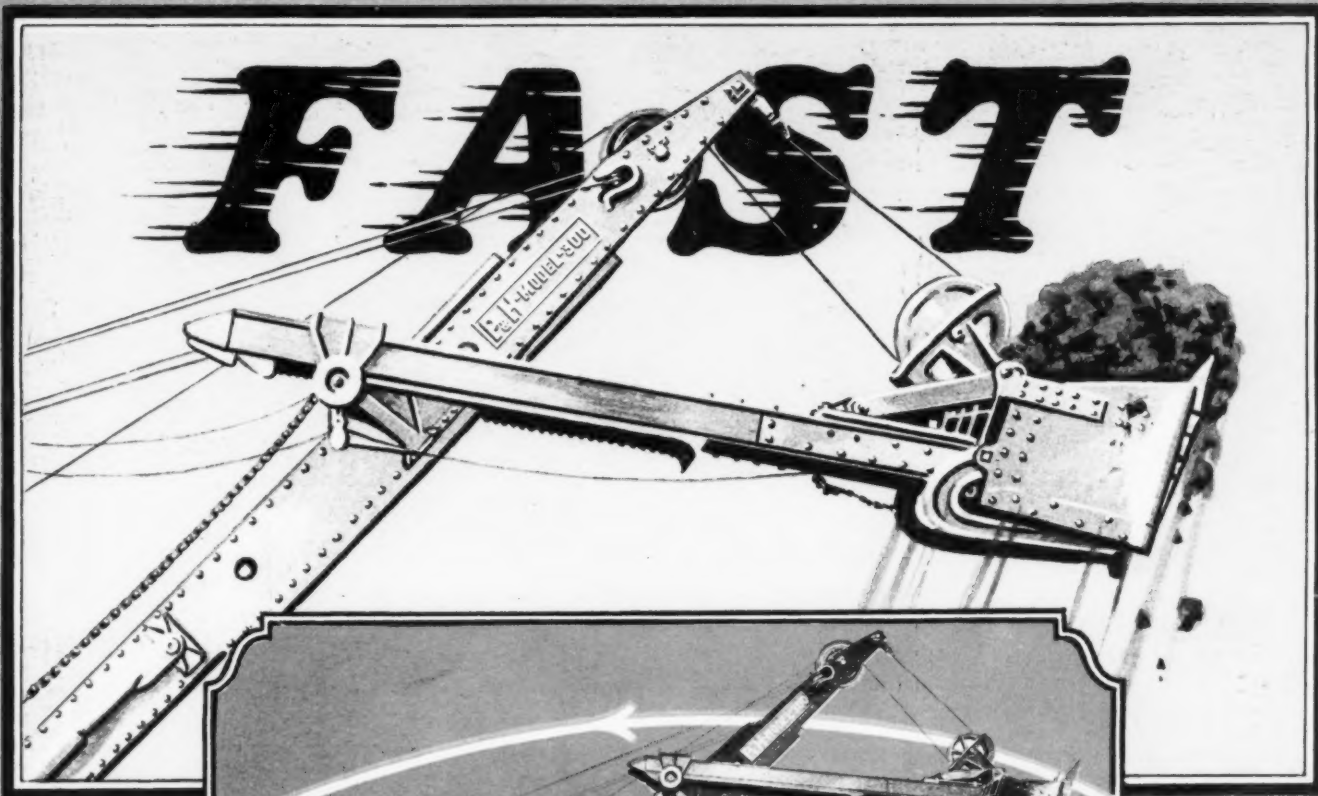


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38th and National Aves. Milwaukee

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HARNISCHFEGER CORPORATION
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Without obligation please send me information on
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Built on this Foundation



TRUCK CRANES

Universals are built to give the utmost in Reliable, Profitable, Enduring Performance.

Measure Universal Performance by any standard—the amount of work it can turn out—its Reliability in standing up on hard, continuous work—its freedom from breakdowns and repairs.

Measure Universal Performance by asking any of the hundreds of Universal owners—in all parts of the world, doing all types of work, operating under all conditions. You'll get proofs such as "We unloaded 16½ cars to trucks in 10 hours"—"After using it for 3 years we don't know how we could get along without it," etc.

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Write for Bulletin 367. It tells how Universal Performance will fit in on your job.

The UNIVERSAL CRANE Co.
976 Swetland Bldg. Cleveland, O.
"Largest and Only Exclusive Builders of Truck Cranes"



**THE usefulness of
a Browning
Truck Crane is un-
limited. It has
capacity plus mo-
bility and is suited
to every kind of
work.**

THE BROWNING CRANE COMPANY

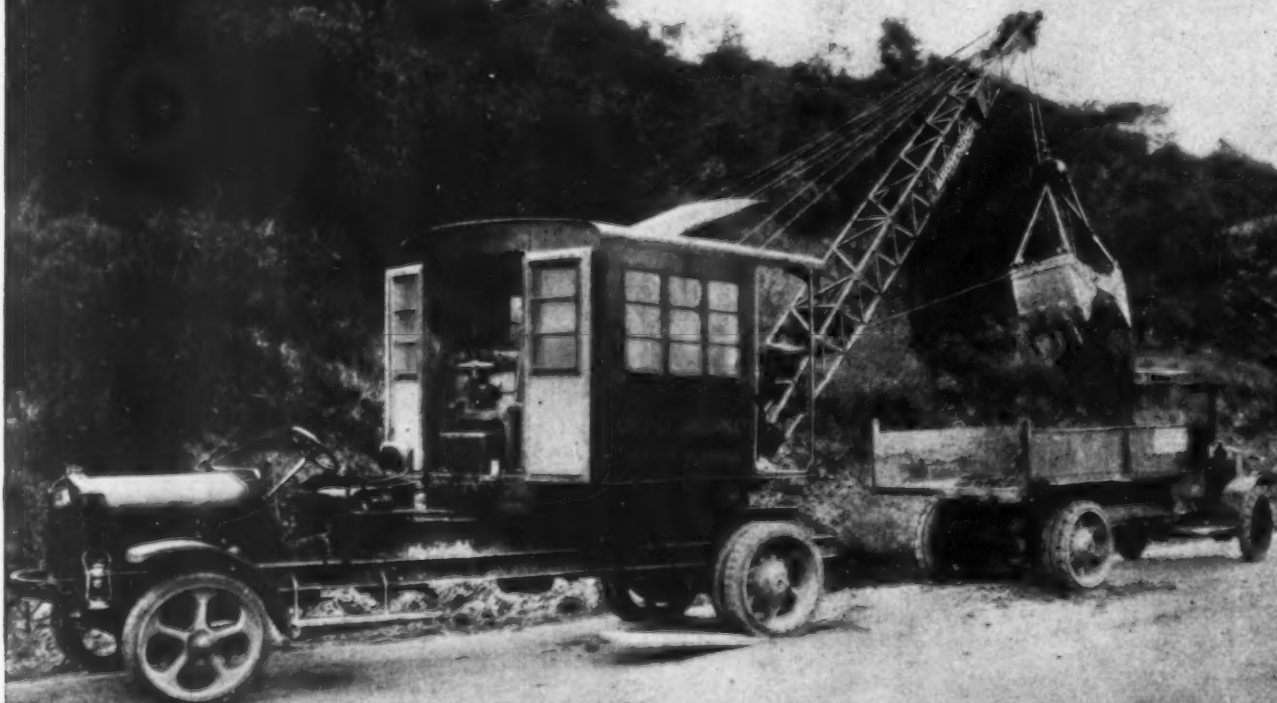
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BROWNING

Link-Belt "Grizzly" Loader

BUILT for rough, tough work, the Link-Belt "Grizzly" Loader is ideally suited for contracting service, such as the reloading and batching of advance storage piles on road building work.

Building material yards have found the "Grizzly" to be the most economical means of keeping trucks on the move. Those who are using them in sand and gravel pits are effecting economies in digging and loading costs never before possible. Send for Book No. 924.



Link-Belt Shovel

YOU will find the Link-Belt Shovel of the very highest character in every detail—a machine you will feel perfectly safe in trusting on any job, no matter how hard, how long.

You will feel, as others do, that the tougher the job, the greater the need for a Link-Belt "Built for Service" Shovel.

Profit by the experience of others, and use it on your next job—our nearest office will be glad to send you Book No. 895 upon request.



3117

LINK-BELT COMPANY

Leading Manufacturers of Elevating, Conveying, and Power Transmission Machinery and Chains

CHICAGO, 300 W. Pershing Road

INDIANAPOLIS, 200 S. Belmont Ave.

PHILADELPHIA, 2045 Hunting Park Ave.

LINK-BELT

Shovels and Loaders

ARE YOU PREPARED for THESE OPPORTUNITIES?



A great corporation, employing thousands of men and consuming millions of pounds of explosives each year, employs a man whose sole duties are the supervision of storage, transportation, and use of explosives in its dozens of operations. By the introduction of better methods he has helped to lower the company's accident severity rate, thereby reducing expenditures for workmen's compensation.

Another company, operating more than a dozen large quarries, producing millions of tons of crushed stone annually, places upon one man the responsibility for the success of huge blasts involving carloads of explosives in a single shot and representing investments of thousands of dollars in labor, equipment, and materials.

Certain difficulties seemed insuperable to a public utilities company engaged in driving huge tunnels many miles in length on a hydro-electric project. A special system of firing holes in rotation, introduced by a man trained in this branch of engineering, solved the difficulty.

The construction industry is awake to the need of such men. The day of rule-of-thumb methods is waning. The need for the scientific application of one of the greatest labor-saving devices of all time—explosives—is becoming widely recognized.

As a contribution to the cause of Industrial Education we have prepared a two-reel motion picture depicting the different types of projects where men trained in this branch of engineering are needed to decrease costs and increase safety.

A half-hour spent in viewing this film is time profitably spent. We will send it, free of charge and postpaid, upon request. Use the coupon below.

HERCULES POWDER COMPANY (INCORPORATED)

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☐ Please send me a free sample copy of "The Explosives Engineer" magazine.

I should like to show your film:

"The Explosives Engineer—Forerunner of Progress."

At.....on.....
(place) (date)

Name.....

Position.....Address.....

The Explosives Engineer

on the job

from the film: THE EXPLOSIVES ENGINEER—FORERUNNER OF PROGRESS



Skyscrapers depend upon his skill



Enormous quarry blasts depend upon his calculations



He removes menaces to navigation



He helps to build dams and drive tunnels on great hydro-electric projects



He removes mountains of copper and iron

*The outside band clutches on
a Marion Type 7 straight gas are*

4½ inches wide

THE swinging clutch mechanism in a gas shovel is its backbone — nothing equals the severe service to which it is subjected. In the Type 7 Straight Gas Excavator, Marion uses the largest clutches ever made for a one yard machine — 4½ inches wide and 25 inches in diameter. For smoother operation, more positive action, longer life and less frequent adjustment, they are of the outside band type. There is no slipping or jerking to wear away your profits. Mail the coupon for further information.

THE MARION STEAM SHOVEL CO., Marion, Ohio, U. S. A.

MARION

27014



THE MARION STEAM SHOVEL CO., Marion, Ohio
Send further information and prices on the Type 7 Straight Gas to
Name _____
Address _____
Nature of work _____

The General Trencher



Easily changed over to shovel, crane, clamshell or dragline without changes or additions in operating machinery. Above is a General with crane and clamshell equipment for laying pipe and filling in trench.

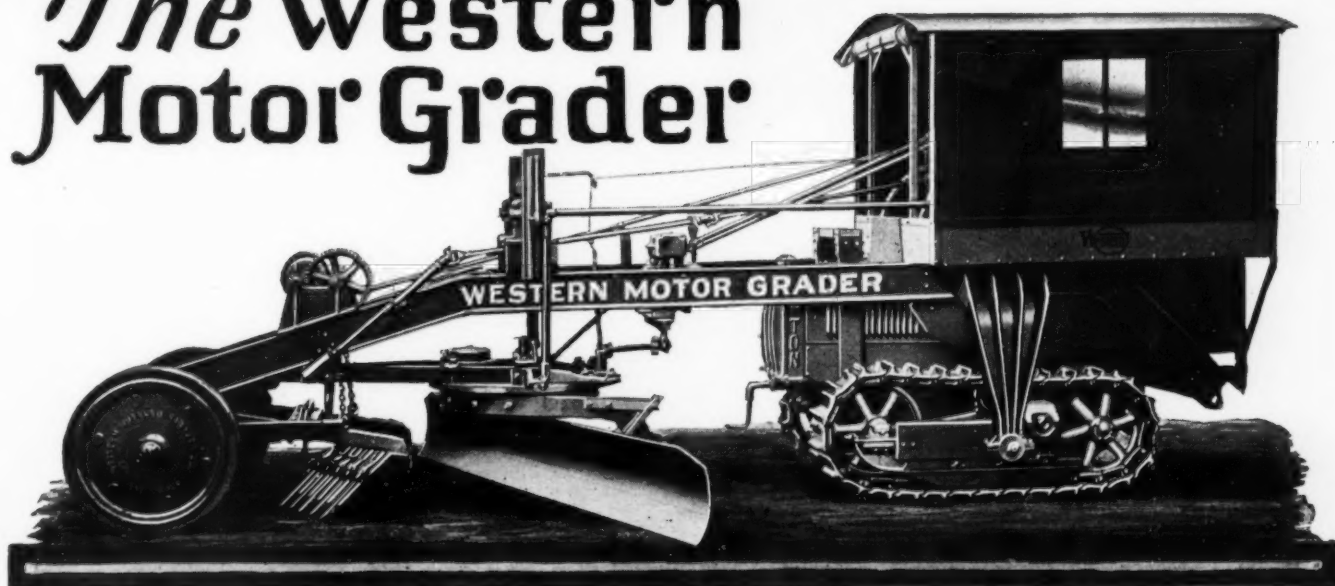
Gas or electric. Digs a trench 16 feet deep, bucket widths 24 inches, 30 inches, 36 inches. Full circle swing—dumps behind as well as at sides. Special design gives enormous bail-pull direct without sheave block. Fast operation. Economical because no power waste in the simplified machinery. Travels away from the work—on solid ground—does not straddle the trench. Built up of steel castings. One-man operation. Distributors and stock machines in principal cities.

General



THE GENERAL EXCAVATOR COMPANY—MARION, OHIO, U. S. A.

The Western Motor Grader

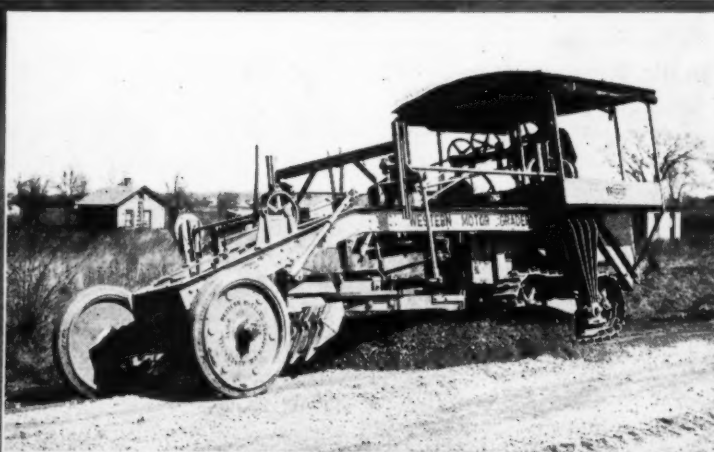
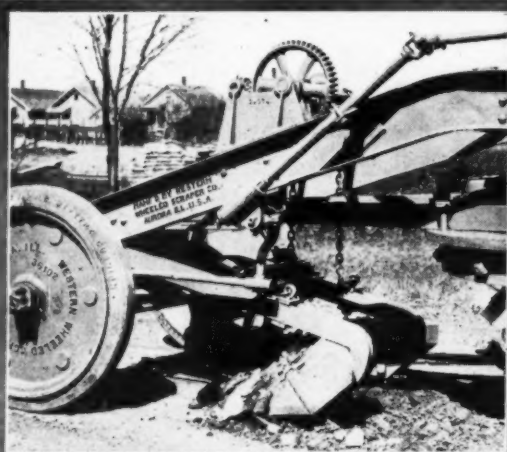


THE ideal motor grader for the majority of public boards is an all-around machine—efficient when it comes to maintenance, yet capable of handling satisfactorily many kinds of ditching and grading—which means that it should have a crawler tread. Instead of using a wheel type tractor with crawler attachment the Western Motor Grader uses the complete two-ton Caterpillar Tractor which has an unexcelled service record. We do not furnish the tractor, but do furnish the necessary parts for attaching the grader to it, which is but the work of a few hours, while it is still easier to unhook the tractor if it should be wanted for some other purpose later on. The connection is made at the exact pivotal point of the tractor, which leaves its ends free to rise and fall with the ground, and without having any effect on the work of the blade.

One of the best features of the Western Motor Grader is its weight and strength. The side rails are 8-inch channels;

the front truck has a king pin connection which insures freedom of axle movement; the front end is heavy enough to insure perfect steering control, while the "no lost motion" construction with all worm gears housed and running in oil, and ball and socket connections, insures smooth work. Regular equipment includes the disc type, rubber tired, front wheels and all steel cab shown in the photographs, but not the canvas curtains which, together with an extremely efficient "A" shaped scarifier attachment and spoked front wheels are supplied on special orders. We can also furnish rubber tread pads which adapt the machine perfectly to gravel road maintenance.

All in all, the Western Motor Grader is an investment that will return big dividends in improved roads and also in time, labor and money saved. The coupon will bring you by return mail a copy of the special bulletin in which its many interesting features are fully illustrated and described.



Please send special bulletin on Western Motor Grader.

Name

Address

Town..... State.....

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HOME OFFICE · 400 N·MICHIGAN AVE · CHICAGO

..... BRANCHES IN PRINCIPAL CITIES



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Sectional Bins



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Road Forms



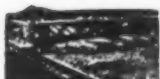
Curb and Gutter



Sidewalk Forms



Joint Machines



Finishing Machines



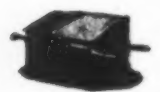
Traveling Bridges



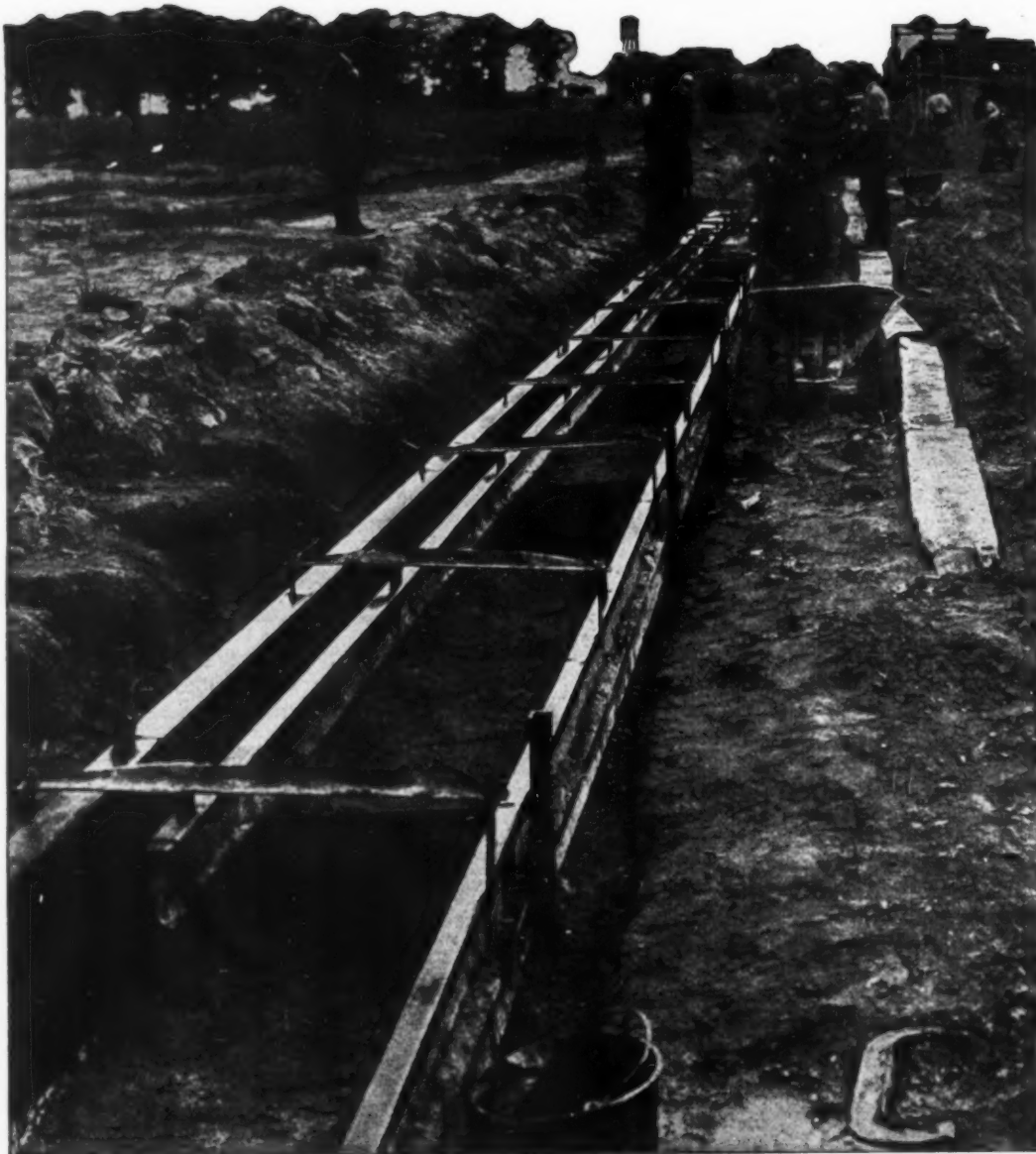
Car Unloaders



Mixing Boxes



Tool Boxes



A Typical Heltzel Curb and Gutter Job

HELTZEL Curb and Gutter Forms have unmatched popularity with municipalities, engineers and contractors.

They align better, set and strip in less time and assure a decidedly better job of concrete work.

Due to the construction, spreading

of the rails is impossible and the face rail cannot creep up.

All division plates can be removed without disturbing side rails.

Write today for HELTZEL Catalogue of curb and gutter and sidewalk forms.

THE HELTZEL STEEL FORM & IRON CO., WARREN, OHIO

HELTZEL

Now is the time to place Carbic Lights on the job

A LIGHT FOR
EVERY NEED



No. 2 Standard
Burns 12 Hours



No. 15
Burns 9 Hours



No. 3 Double Burner
Burns 12 Hours



Cadet
Burns 5 Hours



The days are getting shorter and shorter—soon construction progress will be handicapped by the inevitable rainy season and heavy frosts. Now is the time to add a few hours to each of your working days—like hundreds of other contractors are doing.

Get out your Carbic lights—the night shift is a “cinch” with these trusty units on the job. If you have not already purchased Carbic lights, your jobber can supply them or we can ship directly from warehouses located in all sections.

Carbic lights are operated by inexperienced labor with ease and safety. A trial will convince you. *Write or wire today.*

CARBIC MANUFACTURING CO.

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STOCKS IN OVER 75 PRINCIPAL CITIES

CARBIC MFG. CO.

Date.....

Please send more information regarding Carbic Lights.

Firm Name

Address

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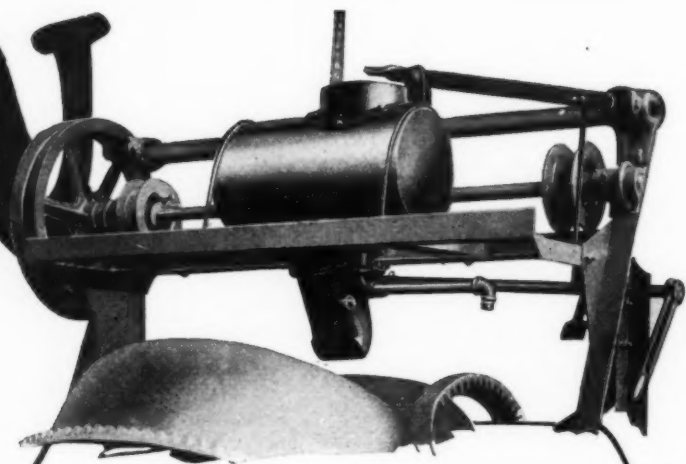
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Individual

Now

The WONDERQUICK

**Accurate Measuring
Easy Operating
Fast Discharging
Water Tank**



THE new Wonder Tank solves the problem of water requirements for concrete mixing. It accurately measures and puts the proper amount of water in the mixing drum when you need it and in the shortest possible time. It's simple to operate. No complicated mechanism—no three-way valve—no tilting or moving of the tank.

The new Wonder Tank is fast—it's simple—it's positive in action.

This is an exclusive Wonder feature—another Wonder time saver to speed up your work and increase your daily output.

The Wonder catalog fully pictures and describes the new Wonder Tank as well as many other profit earning features.

Send for your copy today!
Also ask for new low prices.

**CONSTRUCTION
MACHINERY CO.**

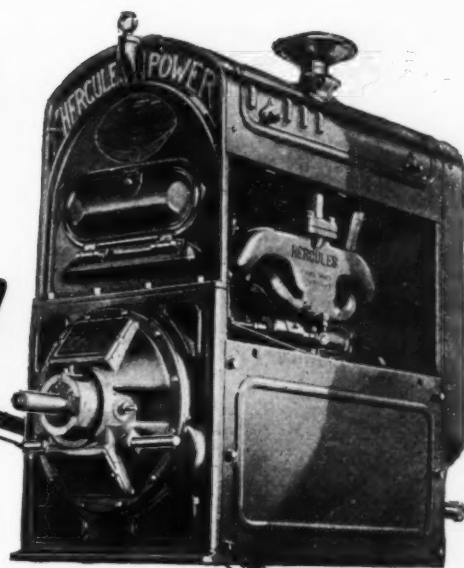
Nationally Distributed From Convenient Points
403 Vinton St., Waterloo, Ia.

WONDER

The Original Single Opening Tilting Mixer

HERCULES ENGINES

are
Eisemann Equipped!



THESE sturdy industrial engines are equipped with an appropriate ignition system—simple, rugged and dependable.

Users of Hercules Power rarely experience ignition troubles. The magneto starts the engine easily—even in the coldest weather—and keeps the engine going as long as the gas holds out.

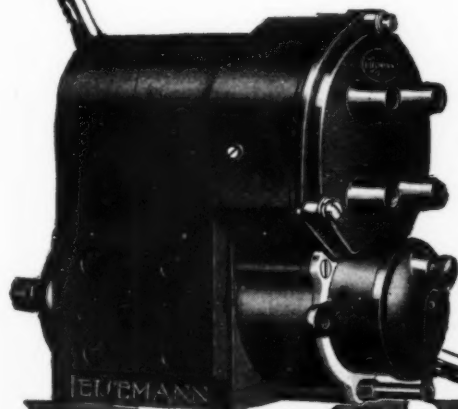
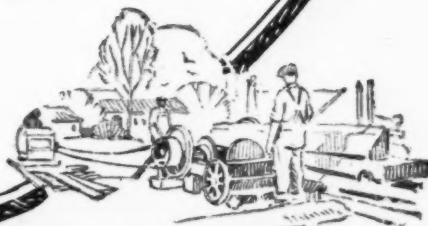
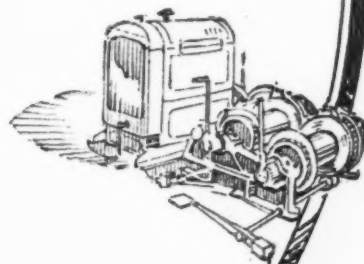
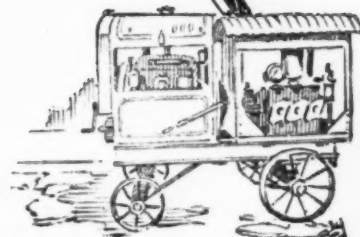
The magneto functions uninterruptedly, regardless of weather conditions—whether the engine is “housed” or works out in the open, uncovered. For Eisemann Magnetos are completely enclosed, and are to an unusual degree immune to rain and dust.

Eisemann Magnetos are used by the builders of Hercules Engines because—like the engine—they stay “On the Job.”

EISEMANN MAGNETO CORPORATION

165 Broadway, New York

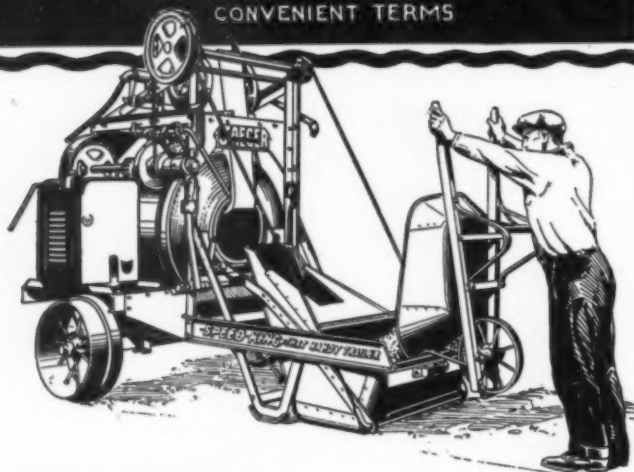
DETROIT SAN FRANCISCO CHICAGO



EISEMANN

ELECTRICAL EQUIPMENT

JAEGER Announces
A FASTER 7S MIXER
THE SPEED KING
\$200 PRICE REDUCTION
CONVENIENT TERMS



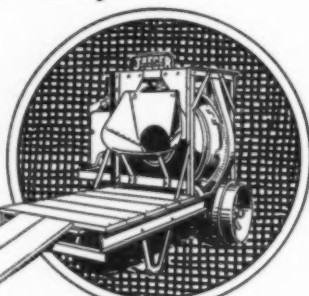
SPEED

More Batches Per Day

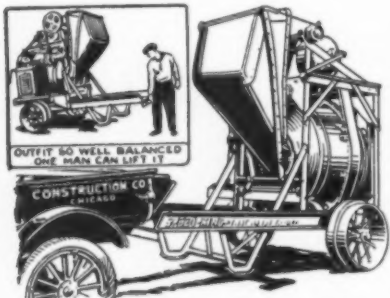
Faster discharge—fast charging without pounding using "Skip Shaker"—fast accurate measure water tank.

END DISCHARGE—Will do anything a side Discharge type will and in addition save labor and wheeling by pouring floors, walks, curbs, alleys or into forms. (Use like a Paver).

STURDIER—100% Roller bearings—steel construction cuts weight 500 lbs., adds 50% strength. More compact. A full one bag mixer.



LOW CHARGER



**PORTABILITY
TRAIL IT
ANYWHERE**

MORE PORTABLE—Trail it anywhere at high speeds—roller bearing wheels—spring shock absorbers—easy to handle, so well balanced that one man can pick up outfit like a wheelbarrow.

Jaeger Mixers furnished in all sizes 3½ ft. to 28 ft. Tilting or non-Tilt types. Write for Complete Catalog—Prices—Easy Terms.

THE JAEGER MACHINE COMPANY

800 Dublin Ave.

Columbus, Ohio

SEND THIS SLIP TODAY FOR NEW PRICE

THE JAEGER MACHINE CO., 800 Dublin Ave., Columbus, O., AO 78

Date.....

Name

Address

City State.....

☐ Non-Tilter (7-10-14-28 ft.) ☐ Plaster Mixer Check size wanted. (3½-5-7-10-14 ft.) ☐ Tilter

**Another Opportunity to Meet
THE WHOLE LOWELL FAMILY
of
Reversible Ratchet Wrenches**

Among them is the wrench you need
WHICH IS IT? WRITE AND TELL US



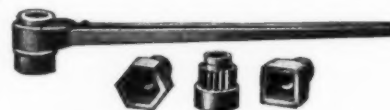
1916 Pattern

Finished all over. Gear openings both hexagon and square from ¼-in. to 1½-in. across the flats.



Lag Screw Pattern

Finished in black enamel with socket openings both hexagon and square from ½-in. to 1½-in. across the flats.



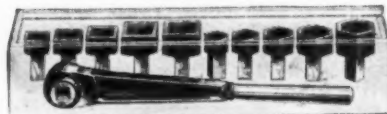
Steel Socket Bridge Pattern

Finished in black enamel with socket openings both hexagon and square from 1-in. to 5-in. across the flats.



Bridge Builders' Pattern

Finished in black enamel with gear openings both hexagon and square from 1-in. to 4½-in. across the flats.



Multiplex Set

No. 1—Capacity ¼-in. to ¾-in. inclusive.
No. 2—Capacity ¾-in. to 1½-in. inclusive.
Expressed in bolt diameters.

**LOWELL
WRENCH CO.**

WORCESTER, MASS., U. S. A.

ASK FOR CATALOG M

PERMANENT AS
THE PYRAMIDS
OF EGYPT



Hydro
Proof

and—

Waterproof!

When Noah built the ark, he used asphalt, inside and out, to seal the vessel against leakage.

At the suggestion of the Egyptian princess, Moses was preserved from death in a basket rendered waterproof by asphalt.

In basements and lavatories; in paper mills, ice cream plants, dairies laundries and other factories where floors are frequently wet and covered with water, a waterproofing material is necessary to preserve the surface against cracking, chipping and disintegration.

Hydro-Proof—pure asphalt, atomized and suspended in water—when applied according to our 1 2 3 Formula, will make concrete, brick, wooden block and other floors positively waterproof. No chipping out of old material is necessary in preparing concrete or brick floors for repairs. 1 2 3 Hydro-Proof can be laid to a feather edge. Hydro-Proofed floors are unaffected by acids, alkalies, salt brine, chemicals or noxious gases. The elasticity of Hydro-Proofed floors takes up the varying strain of heavy trucking and other traffic; also greatly reduces industrial fatigue.

Let us prove to you the enduring, protective qualities of Hydro-Proof as a floor resurfacer. We'll send you a working sample, to try out on your floors, free. Use coupon.

The Asphalt Products Co., 704 FREE STREET, SYRACUSE, N. Y.

Please send me a working sample of HYDRO-PROOF and your 123 Formula, without placing me under any obligations. 704F.

Name.....

Address.....

The World's Most
Enduring Material



Capacities
one to
four yards
for
Auto Trucks
or
Platform
Cars

EASTON ROLLOVER BODIES:

For roadbuilding, sewer work, dam construction and general contracting. Mixed concrete or sticky, mucky material can be handled in Easton Rollovers with all the ease of dry excavation or other loose flowing materials. Their easy automatic operating methods and positive dumping angle does the trick.

EASTON CAR AND CONSTRUCTION CO.
EASTON **PENNA.**

MORE POWER

Here is a High Pressure Power Driven Pump
For Operating Hydraulic Jacks
and Other Hydraulic Tools

It is a three plunger vertical pump driven by a gas engine and mounted upon a truck for easy movement about the job.

We build a full line of hydraulic jacks—standard types, out-side pump types and independent pump types. Pipe benders, reinforcing steel shears and structural shapes benders also presses for testing specimen cubes of concrete.

Write for catalogs

THE WATSON-STILLMAN CO.

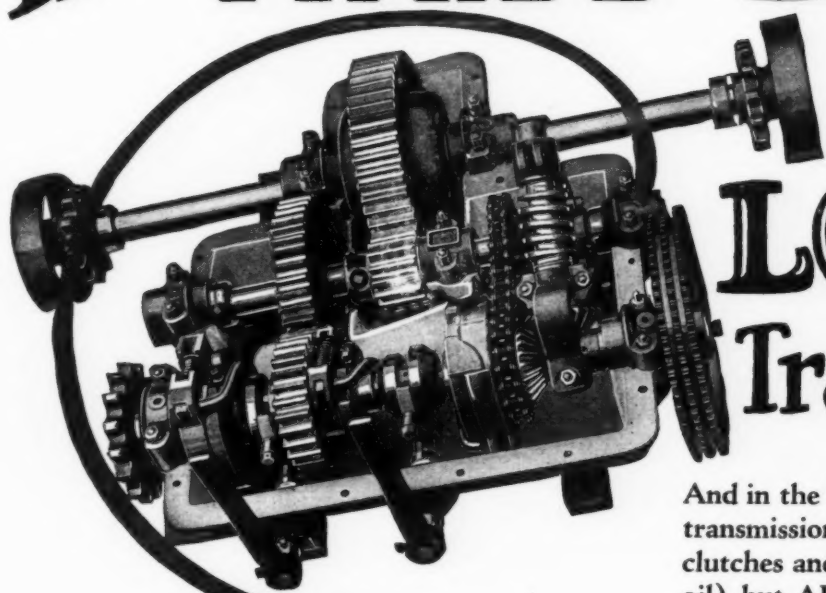
1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd.
Cleveland, Auditorium Garage Bldg.

Philadelphia, Widener Bldg.
Detroit, 7752 Duboise St.



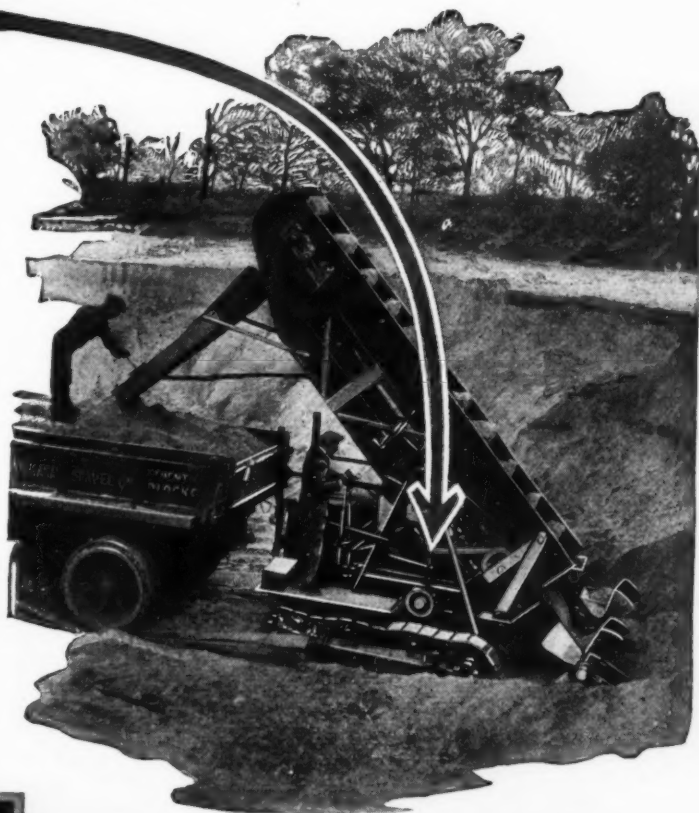
The **HAISS** Loader CREEPER MODEL has a **LOADER Transmission**



And in the NEW model 27 Loader the enclosed transmission case houses not only all the clutches and speed-change gears (all running in oil) but ALSO THE SLOW SPEED WORM DRIVE.

There are other improvements (without any change in the fundamental Hais design) of value to Loader users.

1. Engine power has been increased to 41 H.P.
2. Elevator chain (blocks), elevator and creeper drive sprockets and feeding propellers are now of MANGANESE STEEL.
3. The creeper tread mounting has been lengthened to further increase the stability of the machine.
4. The rigid-pivoted elevator is centered side-to-side and the feeding propellers balanced on either side of the foot of the elevator.
5. A nickel-steel propeller-shaft, redesigned head take-ups, triple-strand engine drive chain—these are factors of longer life and lower upkeep.
6. The swivel discharge chute is now adjustable in its angle of discharge—to be set according to the nature of the material handled.
7. And among the NEW items is a NEW Catalog (No. 527) which should interest every man who is considering a Loader.

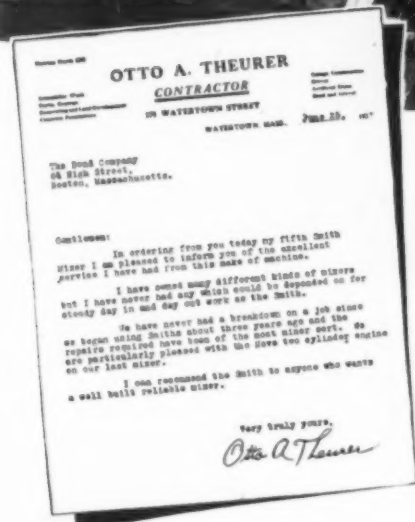


**The George Hais
Manufacturing Co., Inc.**

139th Street and Rider Avenue
New York, N. Y.

Representatives Throughout the World

HAISS



Contractors are always glad they've sent for "Concrete," the most complete book on concrete mixing machinery.

"We have never had a breakdown on a job"

OTTO A. THEURER, Watertown, Mass.

During the 27 years in which Smith Mixers have been built, every point of extreme wear has been long since determined—and made doubly strong.

Thus Smith Mixers, in any size from 2½ to 112 cu.ft. capacity, give a dependable, trouble-free service that makes them the choice of successful contractors the world over.

No other mixer can approach a Smith for sustained speed—and long life. There are features of a Smith that you should know *all* about.

The T. L. SMITH COMPANY
1084 32nd St., MILWAUKEE, WIS.

Sales Offices
and Service Stations in all Principal Cities

Send for this Mixer

Catalog No. 526 Today!



SMITH MIXERS

INDEPENDENT Reinforced Concrete Pipe



Builds Low Cost Sewers that LAST!

SEWERS built of INDEPENDENT Concrete Pipe are both economical to construct and permanent in service.

ECONOMY begins in the special local plant where the pipe are manufactured, and continues through generations of efficient service. INDEPENDENT Pipe Units are laid more quickly and cheaply, because the "Recessed Joint" facilitates laying and sealing, and insures efficient joints under *all* conditions.

PERMANENCE is proved by the fact that concrete pipe sewers have given excellent service since 1850. And "INDEPENDENT" means concrete pipe at its best—Pipe that is quality-built, accurately reinforced, thoroughly inspected and properly cured!

Send for estimates on your prospective sewer work. Our prices and service facilities will interest you. Write or wire us.

INDEPENDENT CONCRETE PIPE CO.
209 North West St. Indianapolis, Ind.

THIRTY-SIX PLYMOUTH HAVE HELPED BUILD WAYNE COUNTY MICHIGAN ROADS

Having carried on a consistent road building program for the past eighteen years, the Wayne County Road Commissioners have developed one of the largest road building organizations in the world.

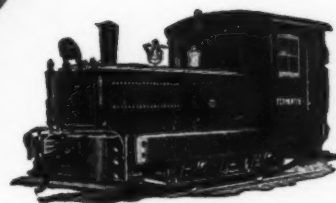
Their building program has averaged fifty miles of new roads in the past six years—mostly hard surface roads, and nearly all twenty feet wide. This is in addition to replacements, repairs and the widening of an average of twenty miles of old roads per year.

Thirty-six Plymouth Gasoline Locomotives have reduced their haulage cost and increased their yearly mileage by placing materials on spot, rain or shine.



*If it's a Track Haulage Problem
There's a PLYMOUTH to Solve It*

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
PLYMOUTH, OHIO

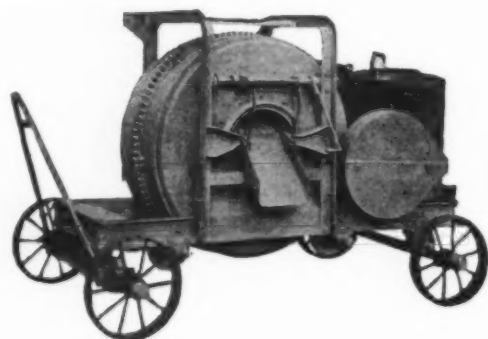


The PLYMOUTH 25-ton gasoline locomotive specially built for heavy hauling and shifting.

PLYMOUTH
Gasoline Locomotives

"The
STANDARD" 7-S MIXER

*permits you to mix your
plaster
with the same efficiency
as concrete or
mortar*



Only with "The Standard" Mixer because of its unique narrow drum construction can you mix plaster as easily and as efficiently as concrete or mortar. The 7-S type illustrated makes an ideal size for general construction work—not too large or too small for the average contractor to use on every job.

*Write for full particulars
on "The Standard" and its
plaster mixing ability.*

**The Standard Scale &
Supply Corporation**
Pittsburgh, Penna.

DISTRICT OFFICES

New York: 145 Chambers Street Philadelphia: 510 Arch Street
Cleveland: 721 St. Clair Ave., N.E. Chicago: 1840 Michigan Blvd.



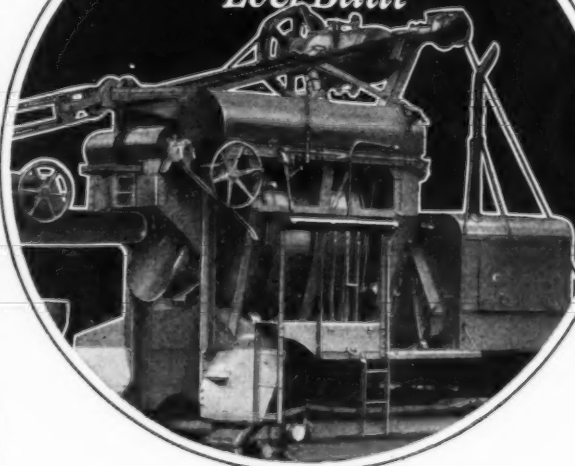
**Do the job
with
Metaforms
save time
and labor—
cut costs**



METAL FORMS CORPORATION

Milwaukee, Wis.

*The Finest
Fastest Paver
Ever Built*



Name those things which you want your paver to give you. Check the New Rex 27-E against them. On this buying basis you will buy the Rex—"The Finest, Fastest Paver ever Built." Ask for a catalogue on it.

CHAIN BELT COMPANY, 764 Park Street, Milwaukee

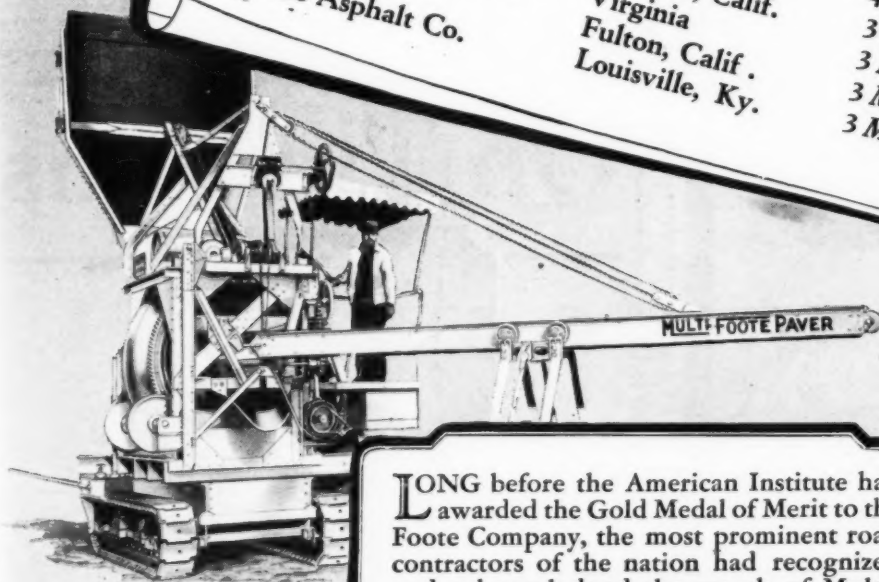
REX PAVERS

(Reg. U. S. Pat. Off.)

THE GREATEST TRIBUTE TO MULTIFOOTE

*-the sincerest recognition of merit
is the repeat order*

Cleveland Trinidad Paving Co. Cleveland, Ohio	29 MultiFootes
Warren Brothers Boston, Mass.	19 MultiFootes
Bitulithic Co. of Texas	15 MultiFootes
Southern Paving Const. Co.	15 MultiFootes
West Construction Co.	12 MultiFootes
Atlantic Bitulithic Co.	11 MultiFootes
F. J. McGuire	11 MultiFootes
Highway Construction Co.	8 MultiFootes
Standard Bitulithic Co.	6 MultiFootes
Grace Construction Co.	6 MultiFootes
Geo. R. Cooke Co.	6 MultiFootes
H. G. Goelitz & Co.	5 MultiFootes
Hamilton-Hoffman Const. Co.	5 MultiFootes
Lave Construction Corp.	4 MultiFootes
Commonwealth Improve. Co.	4 MultiFootes
J. F. Knapp	3 MultiFootes
Hatfield Construction Co.	3 MultiFootes
J. V. Gailbraith	3 MultiFootes
Louisville Asphalt Co.	3 MultiFootes
Chattanooga, Tenn.	
Chattanooga, Tenn.	
Washington, D. C.	
Norfolk, Va.	
Elyria, Ohio	
New York City	
Fort Wayne, Ind.	
Detroit, Mich.	
Chicago, Ill.	
Carbondale, Ill.	
Meridian, Conn.	
Chicago, Ill.	
Turlock, Calif.	
Virginia	
Fulton, Calif.	
Louisville, Ky.	



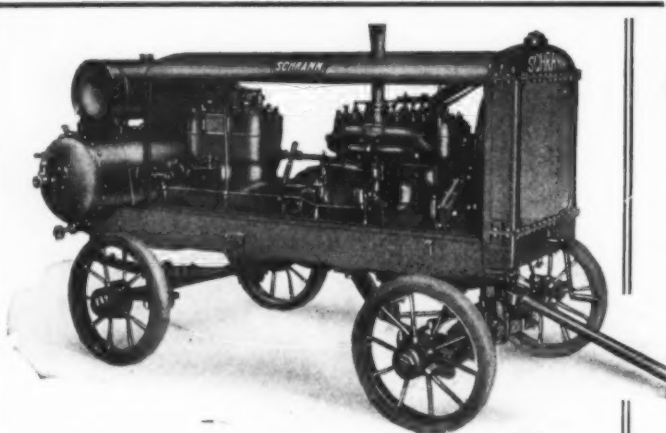
LONG before the American Institute had awarded the Gold Medal of Merit to the Foote Company, the most prominent road contractors of the nation had recognized and acknowledged the worth of MultiFoote. There is no denying the faith that prompted the ordering of a third, a fourth, tenth, eleventh, even a twenty-ninth MultiFoote! *There are more Foote pavers in service than any other make.*

THE FOOTE COMPANY, Inc.
of Nunda, N. Y.

World's largest exclusive builders of road pavers.

Frank E. Hall
152 West 42nd Street
New York, N. Y.
Wilcox Brothers, Inc.
588 Chenango Street
Binghamton, N. Y.
E. J. McHarg & Company
31 Crestmont Road
Binghamton, N. Y.

MultiFoote Sales Company
2811 West Fulton Street
Chicago, Illinois
Burton Franklin
Volunteer Building
Chattanooga, Tenn.
Edward R. Bacon Company
Folsom at 17th Street
San Francisco, Calif.



Sizes—60, 120, 180 and 240 Cu. Ft. Gas, electric or belt drive. Truck, trailer, skid or tractor mounted.

Get the catalog.

Schramm

Compressors— for every contracting and engineering job—

We supply the field with portable compressors for every need, in many types. A big job! But judging from the demand, the repeat orders, and favorable comments from users, Schramm Compressors have made good in a big way. And no wonder.

Powerful Buda engines, each equipped with clutch, governor (a *real* feature) and gas strainer (keeps dirt *outside*), stand up under the worst abuse.

The simple, large capacity compressors keep your tools supplied with full pressure—economically.

Mounting—whatever you want.

Let's coöperate and talk it over.

Inc., Manufacturers
West Chester, Penna.

Offices and Representatives in Principal Cities

Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

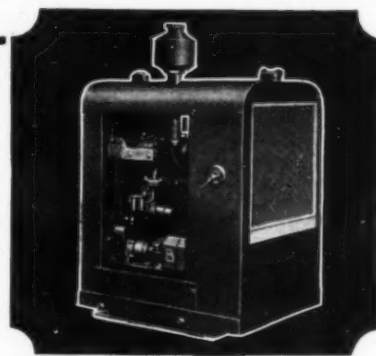
THE BUHL COMPANY

Manufacturers

37 W. Van Buren St., CHICAGO



On Timkens

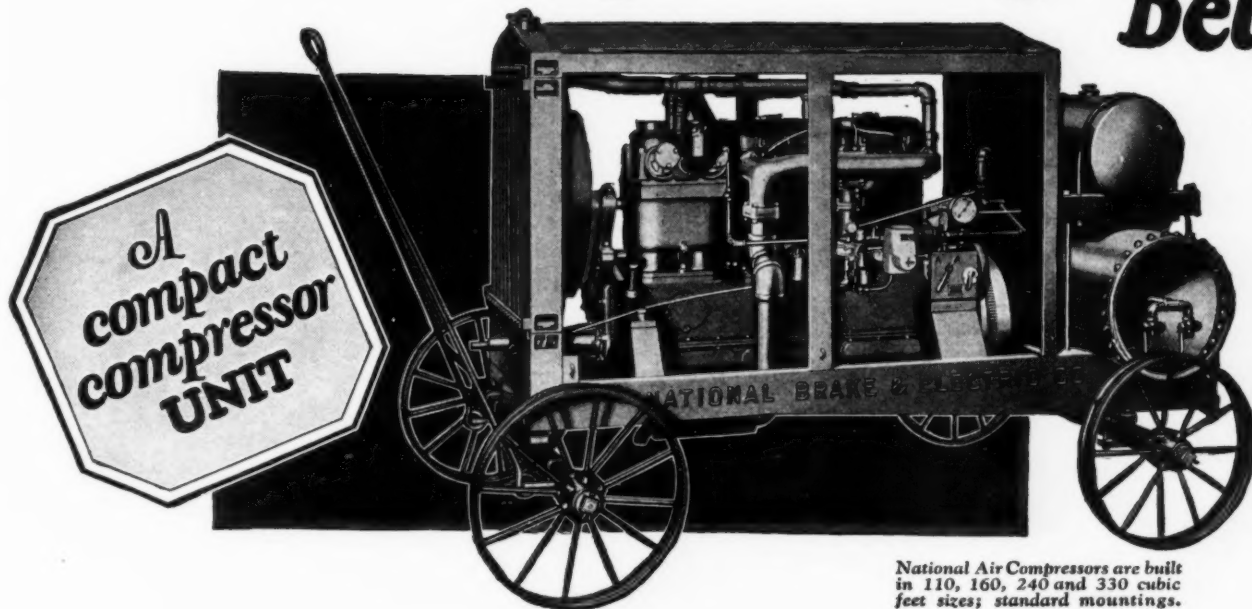


Four Timken Roller Bearings assure perfect alignment of both crank and take-off shafts. They end lubrication worries—and lengthen engine life. But this is only one of 9 New Features of the Newest 2 cylinder engine—that is *without vibration*. Send for others if you're interested in better 6, 9 or 12 h. p.

NOVO ENGINE COMPANY 214 Porter Street LANSING, MICHIGAN

NOVO THE NEW **NOVO**
CLARENCE E. BEMENT Vice-Pres. & Gen. Mgr.
NOVO ROLLER BEARINGS

NO clutches, NO chains, couplings, NO gears, ~ belts



National Air Compressors are built in 110, 160, 240 and 330 cubic feet sizes; standard mountings.

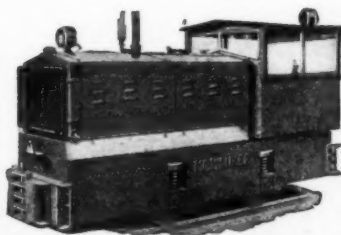
IN the Westinghouse-National, the air compressor and gas engine are built into One Unit, the cylinders of each being mounted on a single crankcase, with a single one-piece drop-forged crankshaft.

This Unit Principle design eliminates all clutches, couplings, gears, chains or belts—achieving a smoothness, simplicity and upkeep economy impossible with previous methods of connecting engine with compressor unit.

National
AIR COMPRESSORS
A WESTINGHOUSE PRODUCT

[Exclusive territorial sales franchises available]

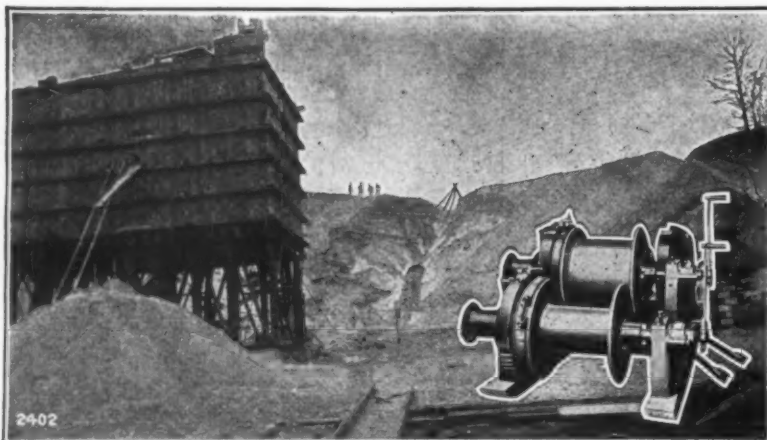
NATIONAL BRAKE & ELECTRIC COMPANY
Division of Westinghouse Air Brake Company
MILWAUKEE, WISCONSIN



Milwaukee Gasoline Locomotives will solve your haulage problem. All sizes, all gauges. Pioneer builders of gasoline locomotives since 1907. Get acquainted with our Type "H" Models.

MILWAUKEE
LOCOMOTIVE MFG. CO.
Subsidiary of National Brake & Electric Co.
MILWAUKEE WISCONSIN

MILWAUKEE
Gasoline Locomotives
Another Westinghouse Product



General view of plant, and the scraper hoist of the Huntington Sand & Gravel Co., Huntington, L. I.



**HOISTS
ELECTRIC
GASOLINE
STEAM
FOR DRAG SCRAPERS**

Inhaul drum has power for digging, outhaul drum has speed for quick return of empty bucket.

A Lidgerwood Hoist—that means power and strength in every part, an insurance against breakdowns; combined with ease in operation. A combination that gives capacity.

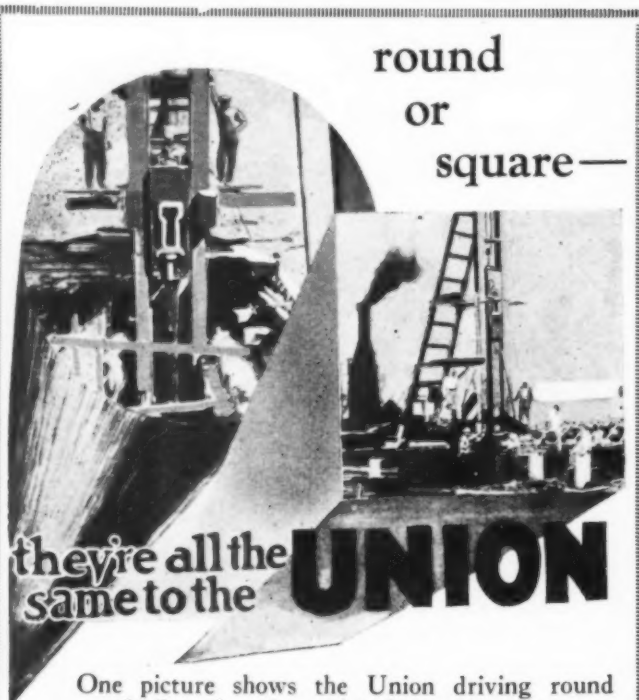
ELECTRIC—GASOLINE—STEAM HOISTS and DERRICKS
For every kind of contractors hoisting service.

Lidgerwood Manufacturing Company, 96 Liberty Street, New York

BRANCHES: CHICAGO PITTSBURGH PHILADELPHIA COLUMBUS, O. SEATTLE PORTLAND, ORE.
BIRMINGHAM, ALA. JACKSONVILLE, FLA. BOSTON
LIDGERWOOD PACIFIC CO., TACOMA

SALES AGENTS: Robert S. Smilie & Co., San Francisco; Woodward Wight & Co., New Orleans; John D. Westbrook, Norfolk, Va.; Cameron & Barkley Co., Charleston, S. C.; Reichman Crosby Co., Memphis, Tenn.; F. C. Richmond Machy, Co., Salt Lake City, Utah; H. H. Meyer Co., Baltimore, Md.; Washington D. C.; Garlinghouse Bros. Co., Inc., Los Angeles, Cal.

FOREIGN OFFICES: London, England; Sao Paulo, Brazil; Canadian, Allis-Chalmers, Ltd., Toronto, Canada.



they're all the same to the **UNION**

One picture shows the Union driving round wood piles; the other, 14-inch square precast concrete piles. Special bases prevent damage to the heads of both types.

**UNION-PILE-HAMMERS
DRIVE
AND
PULL**

Built in 9 sizes—from 195 to 28,000 lbs. In use all over the world.

UNION IRON WORKS
Monroe and Grove Sts.
Hoboken, N. J.



No. 6319

Capacity
100 lbs. to 2 tons.

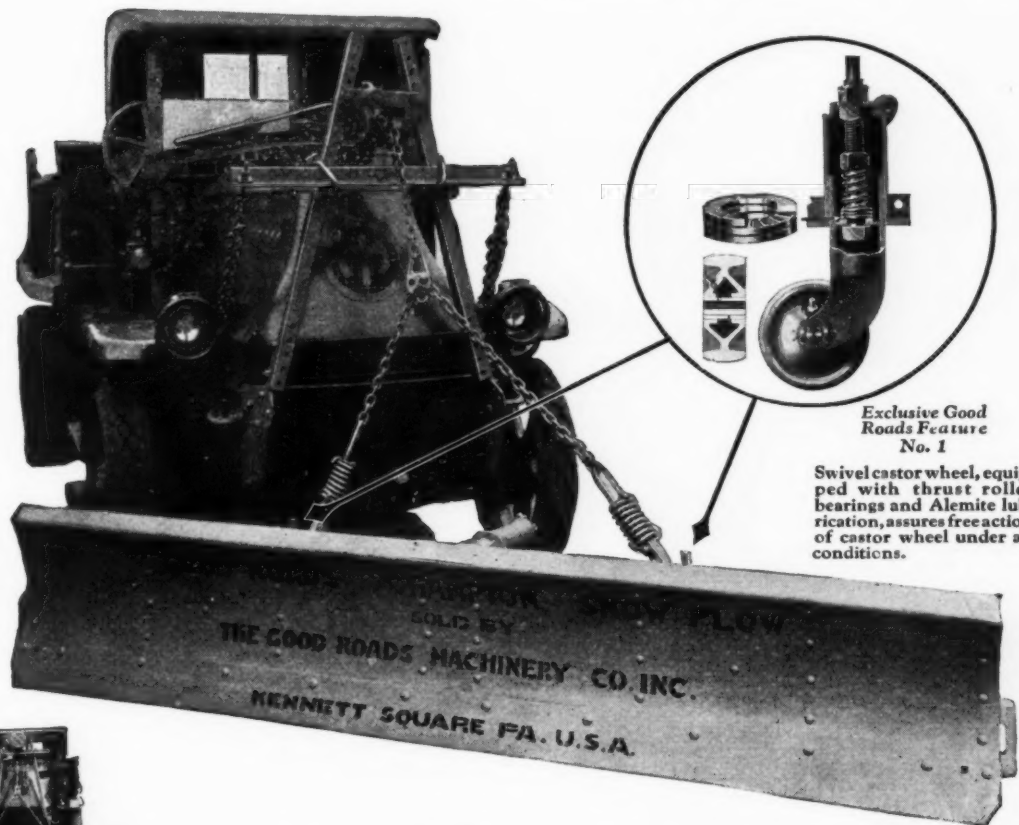
It holds suspended loads SAFELY

The load stays put when handled by a Dobbie Worm Winch. In a hoist of its type, it is very efficient. Send for complete data.

DOBBIE FOUNDRY AND MACHINE CO.
Niagara Falls, N. Y.

DOBBIE EQUIPMENT
PICK UP CARTS DERRICK FITTINGS
SULKY DERRICKS WINCHES ALL TYPES

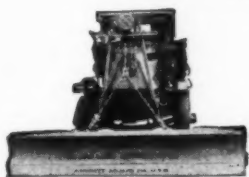
Turning Trucks into Snow Fighters in 10 Minutes!



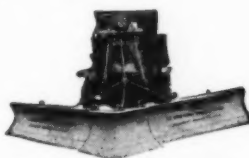
Exclusive Good
Roads Feature
No. 1

Swivel castor wheel, equipped with thrust roller bearings and Alemite lubrication, assures free action of castor wheel under all conditions.

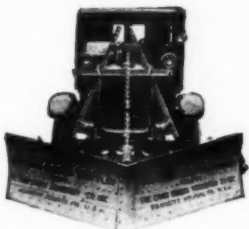
Good Roads
Champion
Blade Type
Snow Plow.
Model 10-C.



Good Roads Champion
Blade Type for motor
trucks—model 11-B heavy.
Same plow as 10-C only
heavier.



Good Roads Champion
High Speed. Adjustable
with V-type. Model 21-B
for motor trucks. Clears a
14-foot sweep at 20 miles
an hour.



Good Roads Champion V-
type for motor trucks—
model 20.

Good Roads SNOW PLOWS

THINK of the trucks that lay idle as soon as the snow begins to fall. Everyone of these can be turned into a snow fighter—in 10 minutes—by attaching a Good Roads Champion Snow Plow. No large investment, just use the equipment you already have and start when the storm does.

Embodying many new and patented features, Good Roads Champion Snow Plows offer you the quickest and most economical means of clearing snow-choked streets and highways. And remember, 3 out of 4 plows now in use are "Good Roads"!

THE GOOD ROADS MACHINERY CO., Inc.
Kennett Square, Pa.
Snow Plow Headquarters

PITTSBURGH, PA. 1523 Oliver Bldg.
NEW YORK, N. Y. 50 Church St.
PHILADELPHIA, PA. 2837 Comm. Trust Bldg.
ALBANY, N. Y. 36 State St.



WATERTOWN, MASS. 36 Pleasant St.
PORTLAND, ORE. 3rd & Hawthorne Sts.
CHICAGO, ILL. 49th & Halsted Sts.
BUFFALO, N. Y. 733 Ellicott Square Bldg.



Our new 1927 catalog is now on the press. Send for your copy NOW!

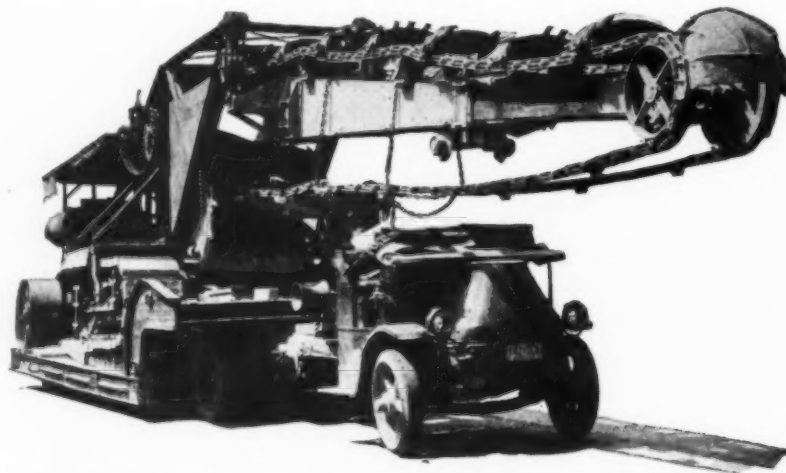
Good Roads SNOW PLOWS

Like the Strong Man

The strong man handles enormous weights. Endowed with great strength he must ever be ready to resist unusual strains. Like the strong man, Rogers Heavy Duty Gooseneck Trailers handle enormous weights. Reinforced at every point to insure maximum strength, they, too, resist unusual strains.

In addition to transporting heavy loads safely and speedily, Rogers Trailers save loads, roads, time and money.

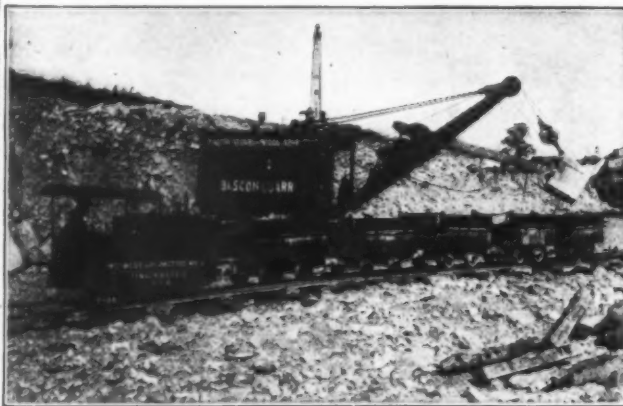
Rogers Heavy Duty Gooseneck Trailers are built to meet any requirement. Tell us your needs.



40-Ton Buckeye Trench Excavator. Moved by Brown Cartage Company, Cleveland, O., for the Kassouf Company, Cleveland, O.

Address—

ROGERS BROTHERS CORPORATION, Albion, Pa.



When on Rock Excavation and the Work Goes Slow

MID-WEST Gasoline Locomotives

will hurry the stuff away when you get it on the cars. They will keep on doing it, too, all day long and all through the job.

Because

They are built for that kind of service and not to make you wonder how you will move the stuff tomorrow.

They are not built "to just get by" but to leave fond memories when the job is done.

Built in sizes from 3 to 25 tons. Let us tell you more about them.

Mid-West Locomotive Works
Cincinnati, Ohio



Making Every Digging Job Pay More Profit

"Our costs per cubic yard of material excavated on three jobs where we have used a Sauerman Power Drag Scraper average over 40% lower than our costs on similar work before we had this machine," writes the superintendent of a large construction company.

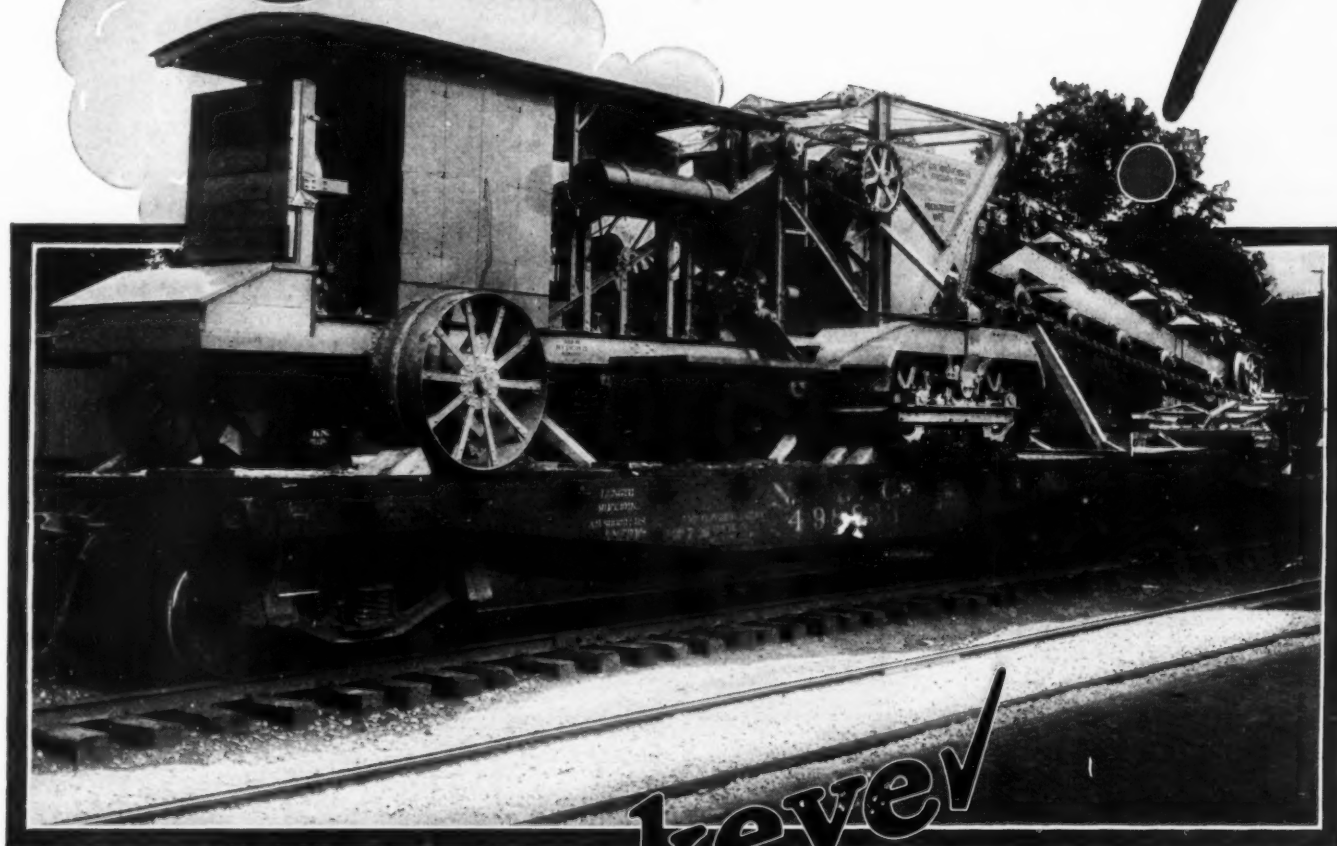
The Sauerman Scraper is light and compact—yet capable of handling the toughest jobs. It digs the material and conveys 30 to 50 loads per hour to the hopper or spoil pile. It has a small power requirement. Its maintenance costs are low. And one man handles all the operating.

A complete range of sizes from $\frac{1}{4}$ to 10 cu. yd., meets the capacity requirements of every excavating job from the smallest to the largest.

To learn more about the profit-making ability of Sauerman Power Drag Scrapers, send for a copy of Pamphlet No. 24.

Sauerman Bros., Inc., 480 S. Clinton St., Chicago

~On its Way!



THE 27th Buckeye FOR MILWAUKEE
THE 10th Buckeye FOR ONE OWNER

Give a Buckeye an opportunity to demonstrate its working ability in any locality, and it's a safe guess that Buckeye will soon predominate in that territory. Its exceptional performance establishes this preference. History proves this to be true.

Milwaukee is only one of the many centers which evidence this fact. Pictured is that city's 27th Buckeye in transit.

This Buckeye is going to Zimmermann & Zimmermann, Milwaukee Contractors, making their 10th Buckeye. They will gladly tell you just why they prefer Buckeye equipment.

Write for illustrative and descriptive bulletins.

The Buckeye Traction Ditcher Co., Findlay, Ohio
There's a Buckeye Sales and Service Office Near You

*Repeat orders consistently
form a large percentage
of Buckeye business*

Buckeye ✓ **TRENCH EXCAVATORS FOR OVER 30 YEARS**

Staking Life On Sullivan Portable Compressors

Seventy feet below the Columbia River, in Washington, a crew of workmen staked their lives on the dependability of Sullivan Portable Compressors.

Booth and Pomeroy are building a million dollar bridge across the Columbia River at Vantage Ferry, 35 miles east of Ellensburg. Two 40 by 60-ft. caissons were to be sunk, one 70 feet and the other 60 feet, in the river bed.

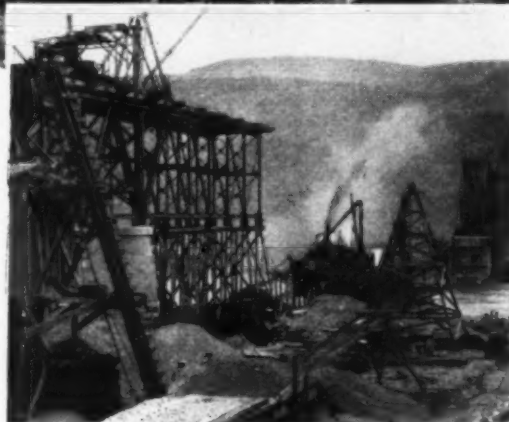
In the caisson pits, air for the men to breathe, and to keep out the water, had to be maintained constantly at 45 lbs. pressure—and 5 Sullivan 310-ft. Portable

Compressors did the job to everybody's satisfaction.

After the job was completed, four of the compressors were taken to Spokane for overhauling, and they were found to be in splendid condition.

Whether life, or only profits, are at stake, you can depend on Sullivan Compressors.

Capacities 103 to 310 ft.; power, Buda engines or electric motors; mountings, steel wheels, trailer trucks, or skids.



Write for Catalog 7283-F

Sullivan Machinery Company
168 S. Michigan Ave., Chicago

S U L L I V A N

This is Your Ticket

*For a Free Tour of Over
50 Contracting Layouts*

Here's a chance to make a free inspection tour of over 50 progressive contracting jobs, without going outside of your own door. Barber-Greene men have gathered information, pictures and layouts on interesting features of contracting work in every section of the country. The best of these have been collected in the 1927 edition of *Loading Layouts*. Sending this ticket brings your copy—send it today.

Name
Address
City State.....
Company

BARBER-GREENE CO. 530 W. Park Av., Aurora, Ill.
Representatives in Fifty Cities
BARBER GREENE
Portable Belt Conveyors Self Feeding Bucket Loader
Coal Loaders Automatic Ditch Diggers Coal Feeder

To Fill Any Form



The Stuebner Controllable Concrete Bucket with its patented device for regulating the width of discharge opening is extremely useful when you are filling narrow or inconveniently located forms.

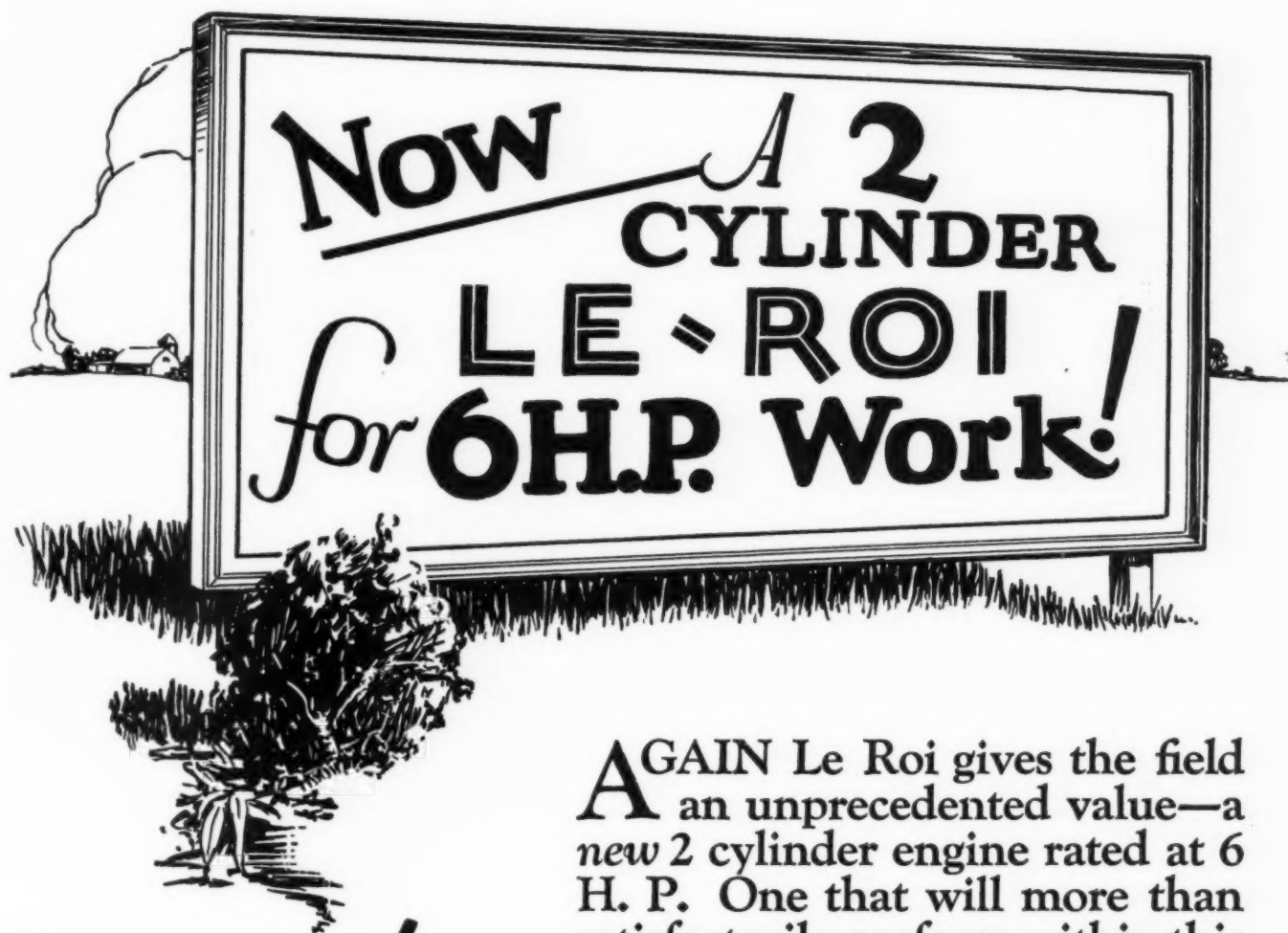
It is a genuine time saving piece of equipment which pays for itself by stopping the waste of material. Write for information.

Turn-over and Bottom Dumping Buckets,
Flat Cars, Push Carts, Steel Skips,
End and Bottom Discharge Cars.

G. L. Stuebner Iron Works

Incorporated

West 12th St. and Vernon Blvd., Long Island City, N. Y.



*For Dependable
Power!*



A GAIN Le Roi gives the field an unprecedented value—a new 2 cylinder engine rated at 6 H. P. One that will more than satisfactorily perform within this power scope.

And think of it—working parts are interchangeable with other Le Roi models. Just a junior member of the Le Roi family imbued with all the “dependable” advantages.

Naturally, the price is down within the bounds of this class.

Le Roi Company *Milwaukee*

LEROI ENGINES
3 to 160 HORSE POWER



How's this for Economy of Operation?

A letter, under date of June 24th from a St. Louis Construction Company* says, "Your paving breakers have been in constant service since September of last year *without any maintenance expense whatever.*" Doesn't that thought suggest the idea that it would be a good idea to get in touch with us?

Address—

The Cleveland Rock Drill Co.
3734 E. 78th St.
Cleveland, Ohio

Manufacturers of

Paving Breakers
Hammer Drills
Clay Diggers

Back Fill Tampers
Calking Tools
Accessories

*Name and particulars upon request.



HUBER



No Job Too BIG No Job Too SMALL!

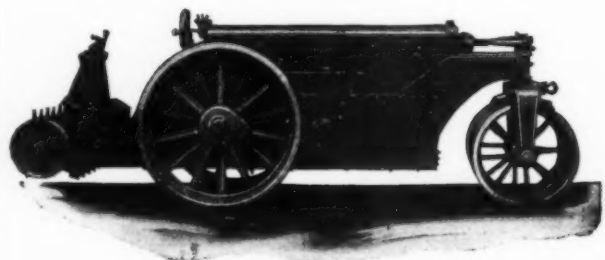
Yessir—Huber likes all sorts of jobs—big ones and small ones alike. If you need a versatile roller—one you can depend upon—one you know will put in 8, 10, 12 or 24 hours a day without a whimper—look to Huber. Huber 4-Cylinder Rollers are made in four sizes (5, 7, 10, 12 tons)—built to do a good day's work every day of the year at the most economical operating expense you ever saw. Investigate Huber today—catalog free—write for it.

THE HUBER MANUFACTURING CO.
355 E. Center St., MARION, OHIO

BUFFALO-SPRINGFIELD ROLLERS

Steam and Motor Propelled

**Built in all standard types
and sizes**



Standard 4-Cylinder Motor, 3-Wheel
Roller equipped with Scarifier

Inquiries invited.

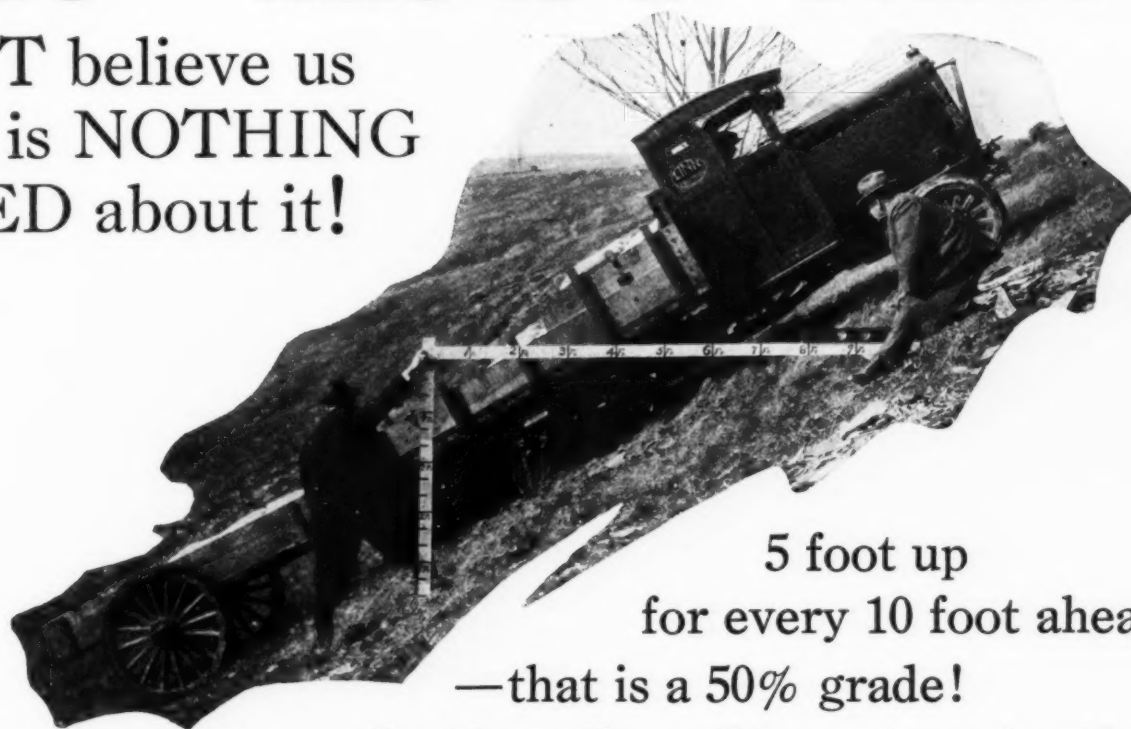


The Buffalo Springfield Roller Co.
Springfield, Ohio.



Sure—this is a “stunt”

—BUT believe us
there is NOTHING
FAKED about it!



5 foot up
for every 10 foot ahead
—that is a 50% grade!

Incidentally pulling a 6-ton load!

Just to show what a **LINN Tractor** can do

It is seldom that you have working conditions on any job similar to those shown above. Yet this kind of a test shows what reserve power LINN Tractors have when you need it. Every major dirt moving job should have a LINN or two around to pull out trucks when they get stuck, to move anything heavy, when other methods fail.

For instance, the Wm. F. Kenny Co., Inc., New York City, have five of their own LINN Tractors on the big development job they are doing for the

Brooklyn Union Gas Company. They are kept busy “keeping the job moving fast” to use the words of E. H. Thompson, General Superintendent of Construction. Mr. Thompson says, “In 26 years experience and practical knowledge of construction, as well as my practical knowledge of equipment, I think I have at last succeeded in finding a Truck that will answer all purposes at all times.”

Note: We are carefully extending our representation and invite inquiries from responsible distributors of contractors equipment.

“Let a Linn do it”

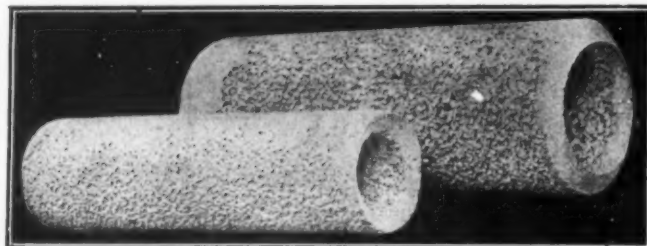
LINN MANUFACTURING CORPORATION, Morris, N. Y.

Division of Republic Motor Truck Co., Inc., Alma, Mich.
New York Office—32-37 Queens Blvd., Long Island City—Stillwell 3996
Mussens, Ltd., Montreal—Canadian Distributors

LINN
MANUFACTURING CORPORATION
TRACTORS

1916—Tested Eleven Years in Actual Service—1927

A NEW TYPE OF DRAINAGE PIPE



Although new in the United States, Rapid Drainage Pipe is not an experiment. This type of porous pipe has been successfully used for twelve years in Europe, and is beginning to be extensively used in this country by railroads and municipalities. One municipality alone—the City of Albany, N. Y.—has 16,355 lineal feet of Rapid Drainage Pipe. This pipe differs from all others in that it is the only pipe that absorbs water throughout its entire surface. Let us tell you more about it—its dependability—its indestructibility—its permanency under superimposed loads—and its efficiency in all kinds of weather. Write for booklet.

WALKER CEMENT PRODUCTS

LITTLE FERRY, N. J.
BALDWIN, L. I., N. Y.

HEMPSTEAD
R.F.D. 3, L. I.

HERMAN WALKER REALTY CO.
(Proprietors)

To make your unwatering and
water supply problems easier!



THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

*Write for literature about this and other sizes
of Morris Pumps*

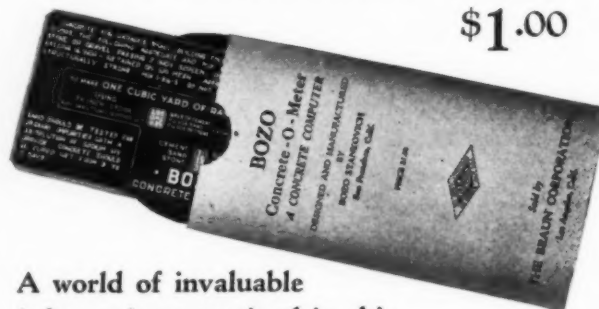
MORRIS MACHINE WORKS, Baldwinsville, N.Y.

MORRIS

CENTRIFUGAL PUMPS

Cut Out the Guesswork Use a Concrete-O-Meter

\$1.00



A world of invaluable
information contained in this
Pocket Size Computing Scale

You have had your Slide Rule and your Trautwirth but never before has there been a device for computing concrete with the absolute accuracy and simplicity of the "Bozo" Concrete-O-Meter. It is a computing scale and Hand Book combined—anybody can use it with equal accuracy—no calculating—just turn the wheel and read the figures—and it costs only one dollar—special price for quantity orders. Send for yours today.

Special Prices for Quantity Orders

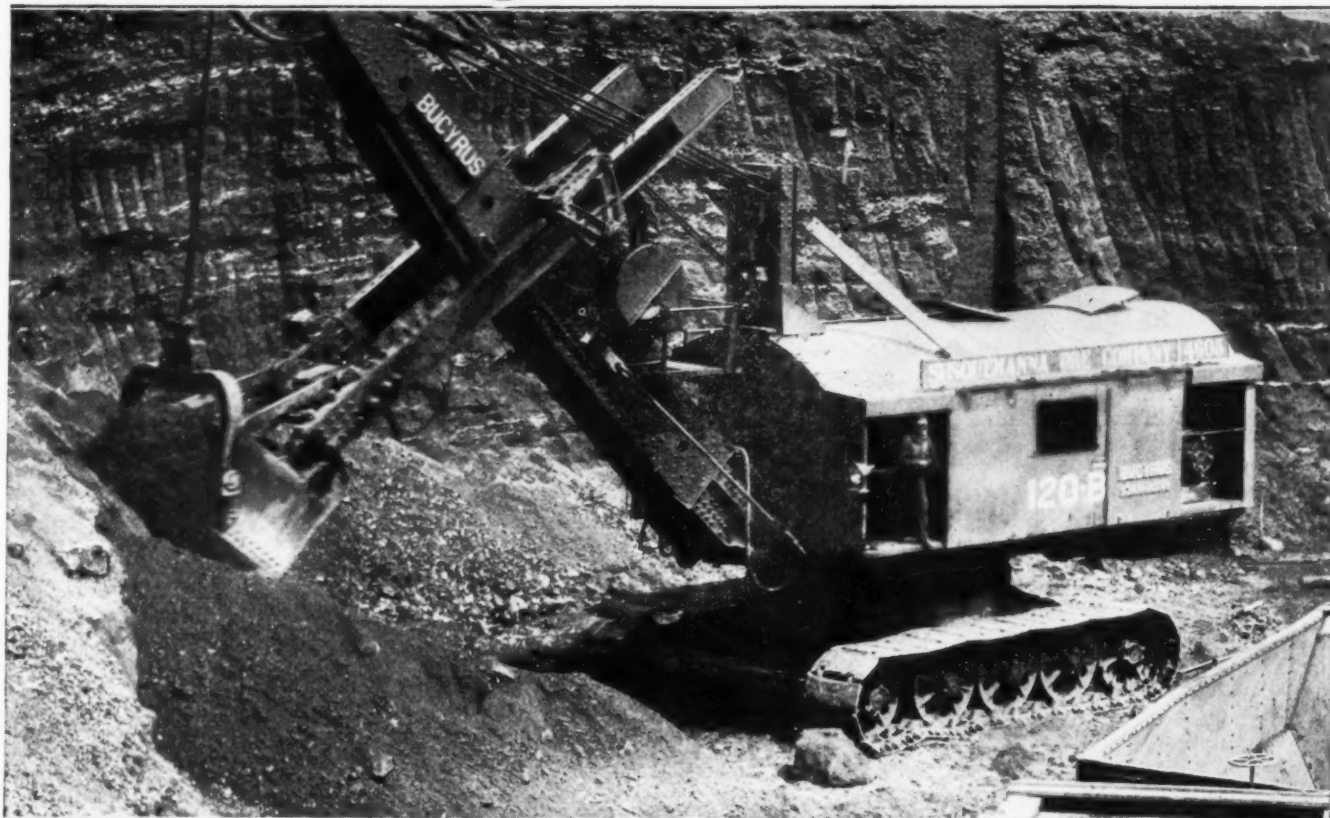
THE BRAUN CORPORATION

San Francisco House
Braun-Knecht-Helmann Co.

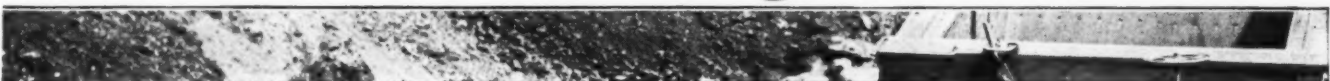
363 New High St.,
Los Angeles, California, U. S. A.

Manufacturers of the Herman Screening Ball Mill

Cutting "delayed" costs



4-Yard Full Revolving Electric Shovel



The new 4-Yard Bucyrus is increasing daily tonnages and lowering per ton costs to the extent, that in one quarry, it replaced two railroad type shovels and produced even more tonnage. The 120-B can dig a wider cut and can clean a wider floor. It has the greater digging and dumping level ranges that only a 360 degree swing can give.

The single caterpillar mounting permits it to move and dig with the freedom of the small revolving shovel—"dead-heading" back is eliminated. And with electrical operation, this 4-yard electric shovel eliminates "delayed" losses—you

The Bucyrus 120-B Electric Shovel provides a new and cheaper method for digging greater tonnages per day in mine and quarry.

can say goodbye to coal and water troubles. The 120-B Electric digs consistently greater tonnages with decided reductions in operating costs.

Our new booklet *The Rock Revolution* tells in detail what the use of electricity means to quarry costs and production. The 120-B Bulletin tells of the construction and digging ability that has replaced the railroad type shovel.

Booklets will be sent upon request. If you are interested in the new method of cutting "delayed" costs, send your request today. Address, Dept.

BUCYRUS COMPANY, South Milwaukee, Wisconsin

BUCYRUS

NEW YORK

CHICAGO

BIRMINGHAM

SAN FRANCISCO

PITTSBURGH

TOKYO

LONDON

CONSTRUCTION METHODS—September, 1927

Page Eighty-five

WILEY WHIRLEYS

Dragline
or
Clamshell
Bucket
1½ to 3¼ Yds

60' to 100' Boom



THE DAYTON WHIRLEY CO.
DAYTON + OHIO.

\$85

BUYS

**THE BEST
CONVERTIBLE
INSTRUMENT
MADE**

The price of the "LOXO" is so small that we cannot afford any trial offer—or inducements — or installment plan.

We sell cheap for cash and if you are not entirely satisfied with the instrument, send it back and your money will be cheerfully refunded.

The "LOXO" has many features found only in the larger instruments which cost many times more.

These special features all are a help to the operator and add to the efficiency and strength of the instrument.

No parts to change or add.
Accurate—Sturdy—Simple.

Learn to use it in 30 minutes. Instruction book included.

Send check or money order direct.

B. L. MAKEPEACE, Inc.
387 S. Washington St., BOSTON, MASS.
No obligation—write for our proposition on the "LOXO" Compound Level



"LOXO"



No. 7881

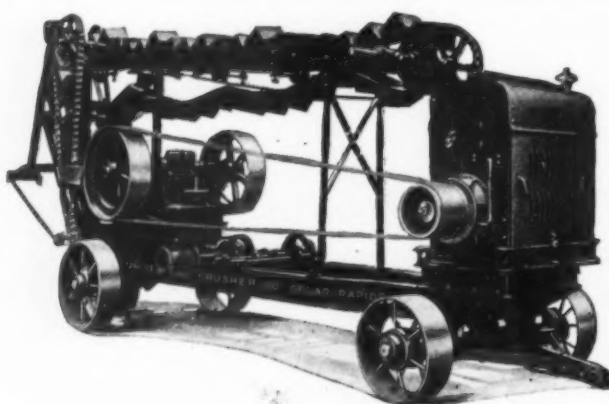
KOLESCH "Builders' Dumpy" Level

Increased production has enabled us to reduce the price of this popular level.

NOW \$60

The Kolesch Iron Clad Guarantee means each purchaser's money back if not satisfied in every respect.

KOLESCH & CO.
138 Fulton Street,
New York, N. Y.
Established 1885



This is a popular type of UNIVERSAL CRUSHER

Illustration shows method of mounting crusher on steel roller bearing truck with steel folding elevator and four-cylinder gas engine. Very popular for road construction and maintenance and a favorite with contractors. Always ready for work with no delay setting up. Capacities 30 to 100 tons daily.

10 larger sizes, capacities to 450 tons daily.

Every Universal is Manganese Equipped

UNIVERSAL CRUSHER COMPANY, 327 8th Street, West, Cedar Rapids, Iowa

The BEAR CAT Skimmer "eats up" a job like this!

WHEN you have a shallow cut to make, do it with the Bear Cat Skimmer. The bucket crowds out from the machine in a long horizontal stroke, making a true, even grade and a full bucket at each stroke.

Note how the Bear Cat on its mobile full crawler mounting gets in between car tracks and curb and around poles. It has been wonderfully successful at this class of work, owners reporting that they dig and load 300 to 400 cubic yards a day, at an average operating cost of about \$15.00.

The Bear Cat is operated by one man, no ground man being employed. Its rugged all steel construction enables it to stand up under continued hard digging with a minimum of repairs. It is known everywhere for its dependability.

For economical road and street grading, you can't beat the Bear Cat Skimmer.

And when you want to handle materials, dig ditches, backfill or excavate, all you need to do is to put another attachment on the same machine.

It's the most machine for the money on the market—big enough to do the work—small enough to be fast and economical.

Wire, phone or write for full details.

BYERS MACHINE COMPANY, Ravenna, Ohio

Sales and Service Throughout the Country

Builders also of Byers Trucrane

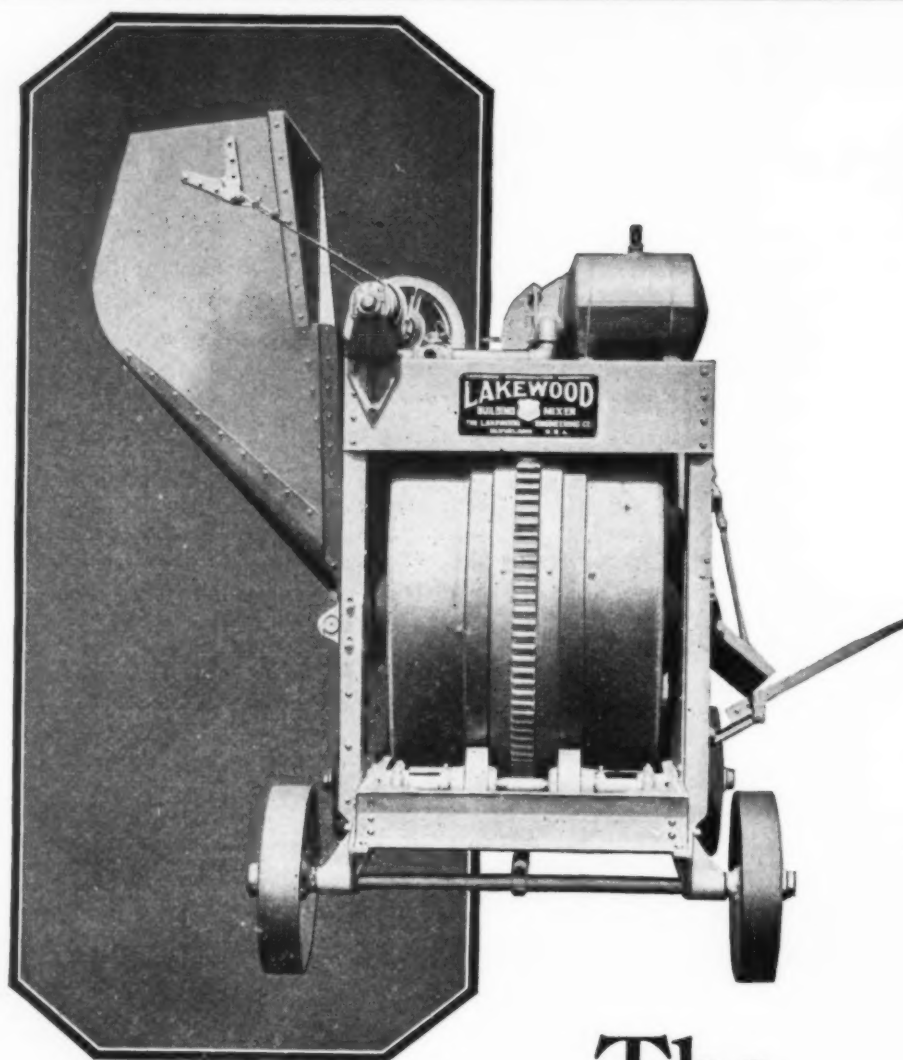


Byers Bear Cat Skimmer owned by International Motor Service Co., St. Louis, on street grading job

BYERS BEAR CAT

CRANE—SHOVEL—DITCHER—SKIMMER—BACKFILLER
HALF CIRCLE OR FULL CIRCLE SWING

BYERS MACHINE CO., Ravenna, Ohio
Gentlemen:—
Please send me information about the BEAR CAT. The
kind of work I am interested in is.....
Name.....
Address.....
Town.....
State.....
CM 9-27



The LAKEWOOD 10-S

(A Mixer with all the features you've been looking for)

Speed, of course—there is none so fast.

Light and easier to move—yet stronger, too, for pressed steel parts have replaced the dead weight of cast iron.

Alemite Lubrication—Hyatt Roller Bearings—and all the advantages of the famous Lakewood Worm Speed Reduction Drive are combined—yet the price is no more than you pay for an average mixer.

Mail the coupon today and get the whole story:—it takes only a minute.

Please send us complete information on the NEW Lakewood 10-S MIXER.

Name.....

Address.....

THE LAKEWOOD ENGINEERING COMPANY, Cleveland, Ohio

The EXPORT OFFICE: 30 CHURCH ST., NEW YORK CITY—CABLE ADDRESS: BROSIRES

LAKEWOOD ENGINEERING CO.
CLEVELAND, OHIO

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HUMDINGER PUMPS

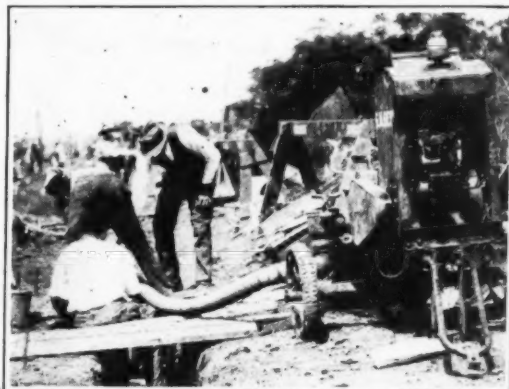
Will Discharge Anything That Enters the Suction End

THE *Humdinger* shown here was the first used by the G. M. Gest organization. On the strength of its performance J. H. Gest writes, "We have now discarded our other pumps and are standardizing on the *Humdinger*."

Their SUSTAINED PERFORMANCE UNDER SEVERE CONDITIONS tells its own story. Write for the *Humdinger* Bulletins.

When you need a pump you need a **HUMDINGER**

RALPH B. CARTER CO., 126 Chambers St., New York
Hackensack, N. J.



FOR EVERY DEWATERING PROBLEM

No pump on the market has greater adaptability than Humphries Lift and Force Trench Pump.

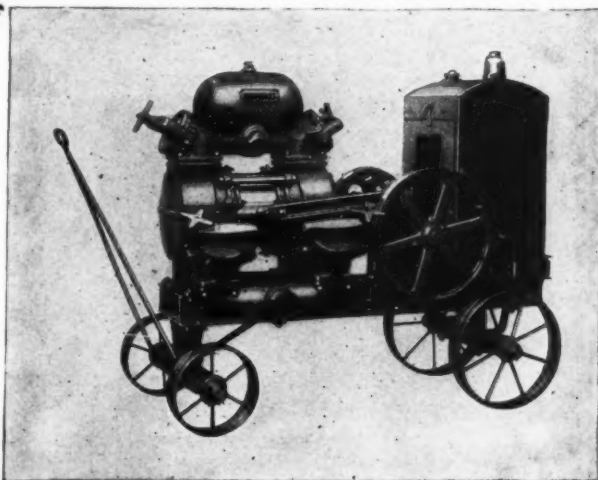
Easy accessibility, sturdy construction and high capacity combine to make it the pump for the job.

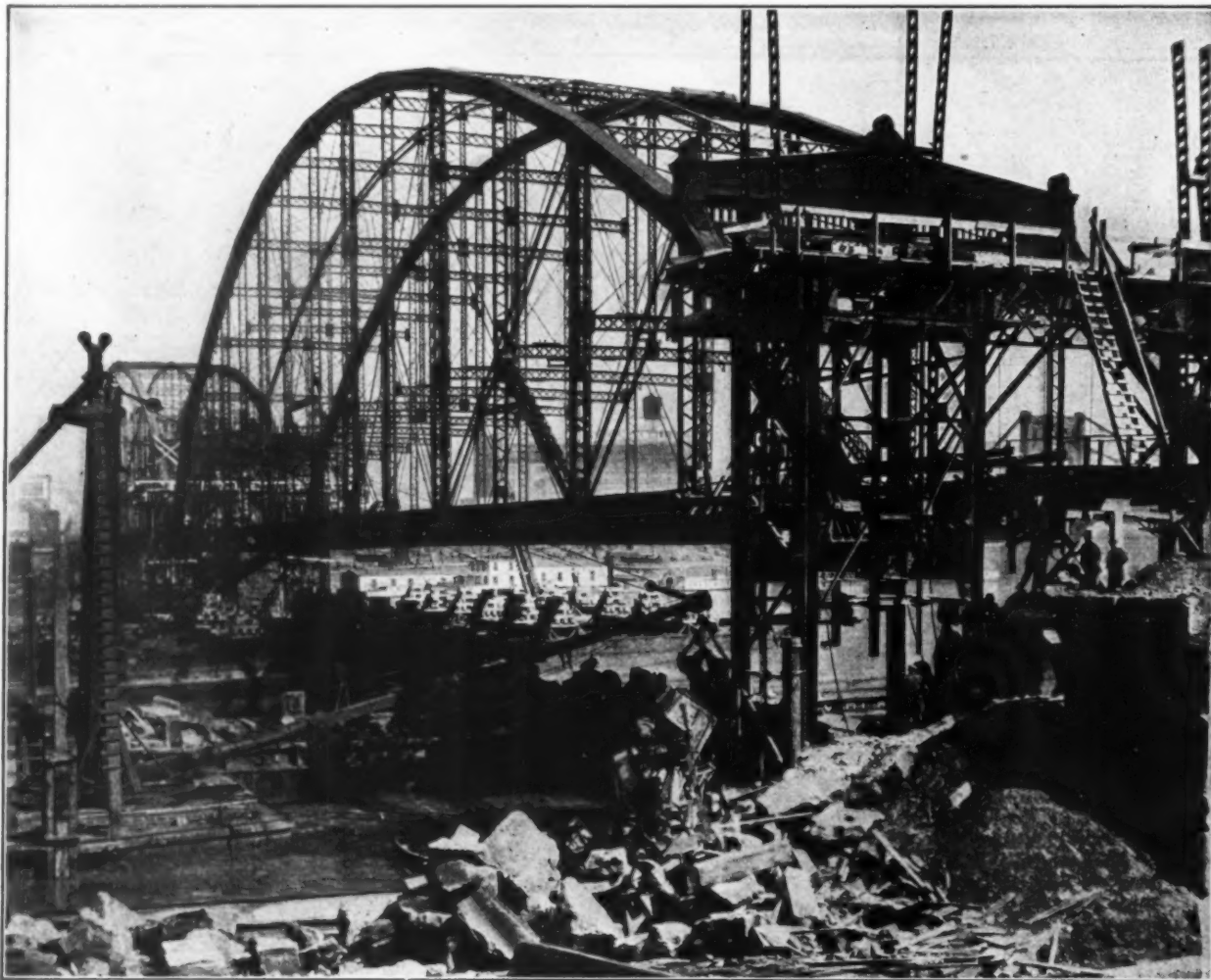
The special outside packed plunger enables liquids formerly only handled by diaphragms, to be pumped.

There are less delays, fewer annoyances and no diaphragm replacements with this pump.

Write for details.

THE
HUMPHRYES
MANUFACTURING COMPANY
MANSFIELD, OHIO





Moving of Sixth Street Bridge

Pittsburgh, Pa.

County of Allegheny

The Foundation Company, General Contractor

Of this interesting job of The Foundation Company, a recent engineering periodical states: "The moving of the Sixth Street Bridge, which for many years has spanned the Allegheny River, to Coraopolis, about 10 miles down the Ohio River, has been attracting attention in the construction field." One phase of the scope of work of The Foundation Company is the undertaking of unusual engineering projects and bringing them to a satisfactory completion.

THE FOUNDATION COMPANY

CITY OF NEW YORK

*Office Buildings
Industrial Plants
Warehouses
Railroads and Terminals
Foundations and Underpinning
Filtration and Sewage Plants*

ATLANTA
PITTSBURGH
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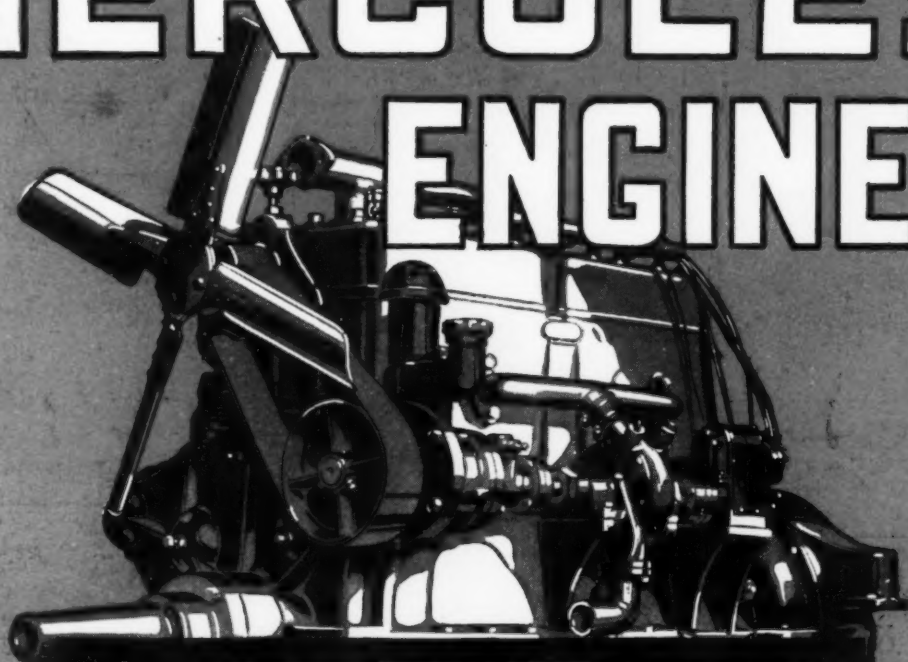
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MEXICO CITY
CARTAGENA, COLOMBIA
LIMA, PERU

LONDON, ENGLAND
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BRUSSELS, BELGIUM
TOKYO, JAPAN

*Hydro-Electric Developments
Power Houses
Highways
River and Harbor Developments
Bridges and Bridge Piers
Mine Shafts and Tunnels*

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

HERCULES ENGINES



Under the brutally-constant strain of ditch digging, the power plant must be dependable and constant.

Shocks of varying degrees of severity, imposed without quarter, must at all times be withstood. There can be no hesitation, no faltering!

It is natural, therefore, that the Buckeye Traction Ditcher Company of Findlay, Ohio, has chosen Hercules Engines as the power plant for their Type C Model 200 Trench Excavator.

For Hercules Engines—of greatest simplicity of design—start when the switch is thrown in and stop only when it is thrown out.

HERCULES MOTORS CORPORATION, CANTON, OHIO, U. S. A.





Easier
TO HANDLE
Quicker
JOINT-MAKING
Safer
IN SERVICE



*W*RENCHES the only tools. Experienced labor unnecessary.
No bell holes to dig. No hot lead. No cold lead. No calking.
Eliminates all joint-making materials and equipment.

EVER LOOK into Universal Pipe? It's the only cast iron pipe that makes its own joints.

Laying Universal Pipe is simplicity itself. Labor intelligent enough to use a ratchet wrench can do the job.

No hot lead, no cold lead, nor any other jointing material is used.

The hub and spigot ends, machine-tapered at slightly different angles, are drawn into direct contact forming flexible iron-to-iron joints that amply provide for expansion and contraction, vibration and uneven ground settlement.

Nothing in the joints to work loose, nothing to blow out, because the joints as well as the pipe are all-cast iron.

The standard six-foot lengths are easier to handle and quicker to lay. Installed anywhere in any season, up hill and down, in rock, in sand, in narrow trenches—wet or dry, on bridges and under water. Straight lengths laid on curves of 100 feet radius.

Dependable, flexible, safe — *Universal Pipe joints are as tight as the wall of the pipe itself.*

Valves and hydrants

of the best known makes come with the Universal Pipe joint.

Universal Pipe saves all along the line. It is a sure safeguard against costly replacements and a positive protection against the risk and waste of leakage.

Thousands of miles are installed the country over every year, much of it by common labor.

Let us show you how much more economical, how much more dependable Universal Cast Iron Pipe really is. It will pay you to mail the attached coupon now.

**The only
cast iron pipe
that makes
its
own joints!**

Date _____
The Central Foundry Company
Graybar Bldg., Lexington Ave. at 43rd St., New York City
I am interested in Universal Cast Iron Pipe and Fittings for

(Mention kind of service)

Individual _____
Company _____
Address _____

